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COLLINS ARMS, 18 THE COLLINS ARMS, HIGHER FORE STREET, REDRUTH, TR15 2AP

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**Grid Ref:** 170235, 42164

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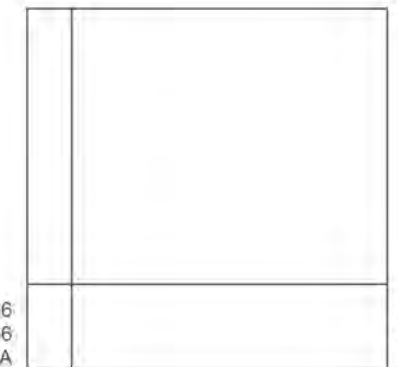
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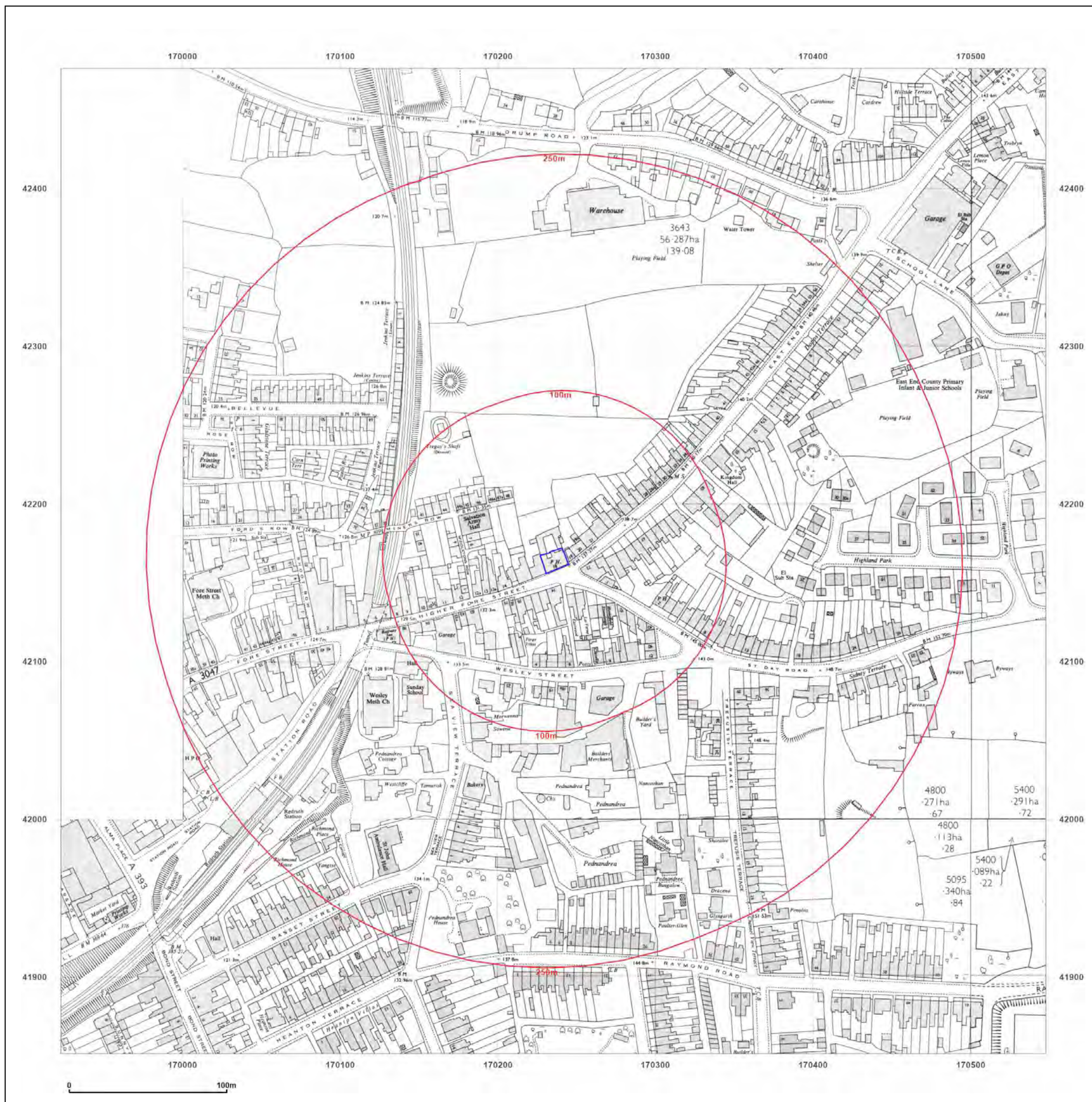
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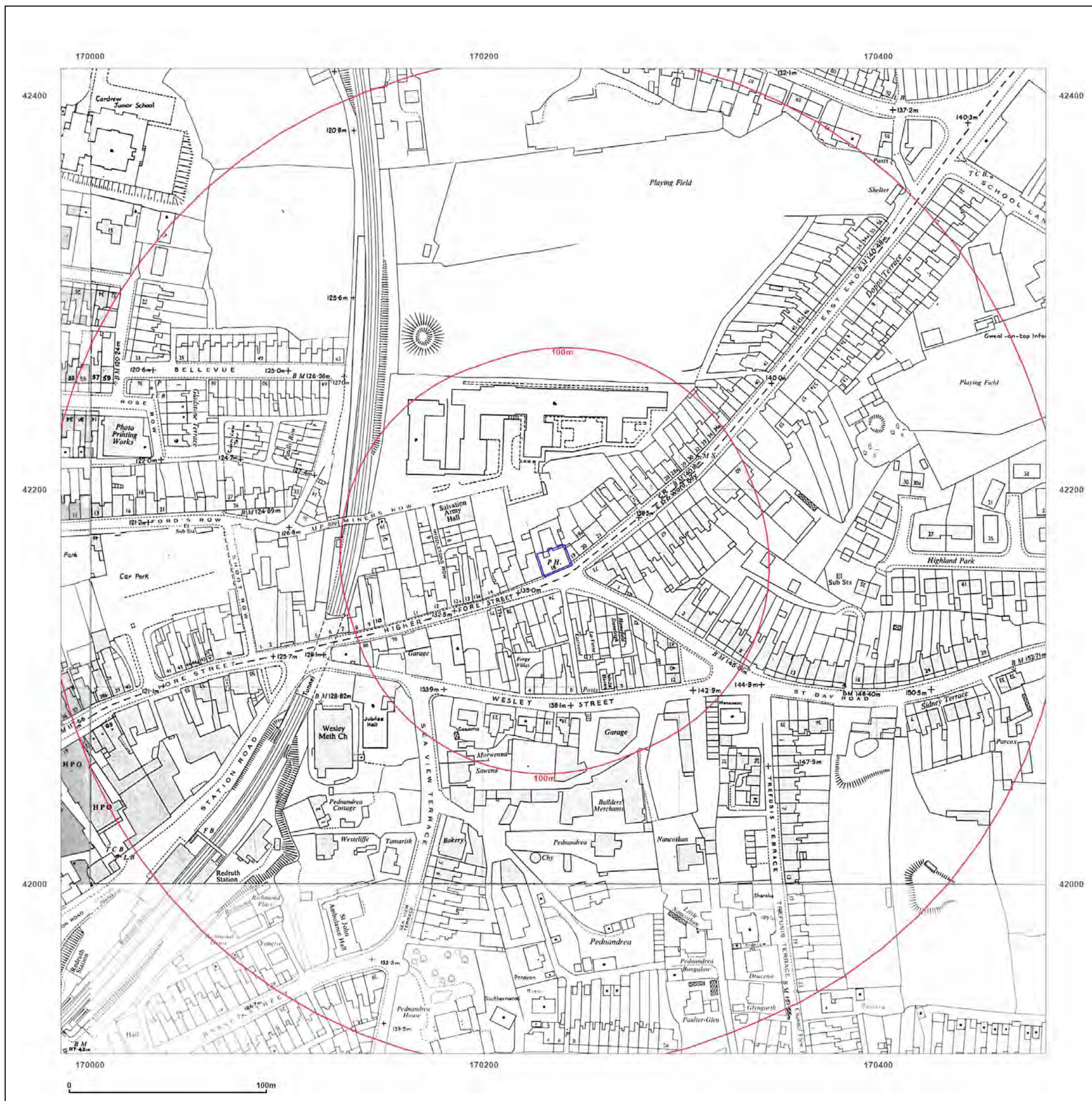
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Edition N/A  
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Revised N/A  
Edition N/A  
Copyright 1989  
Levelled 1972

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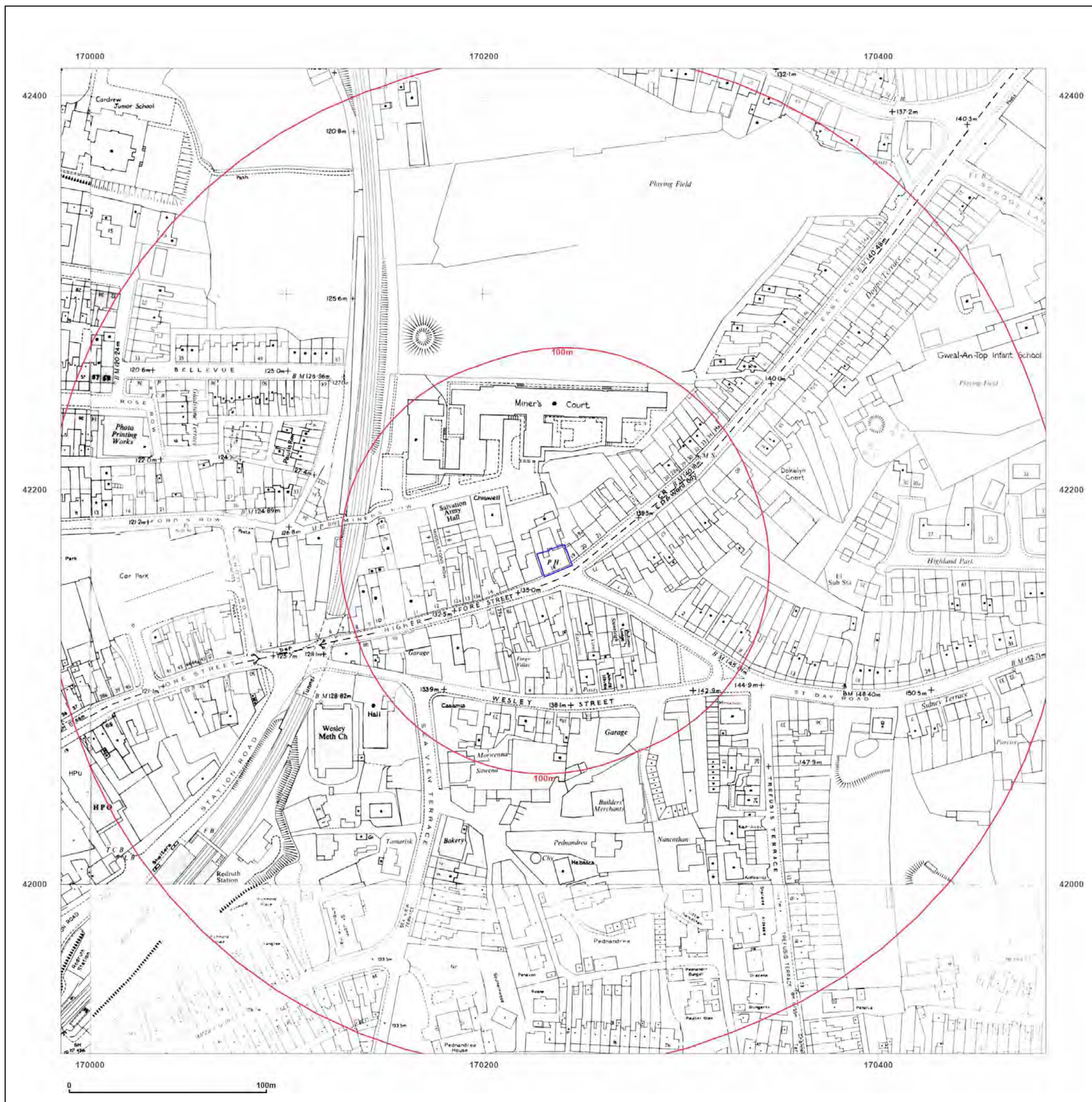
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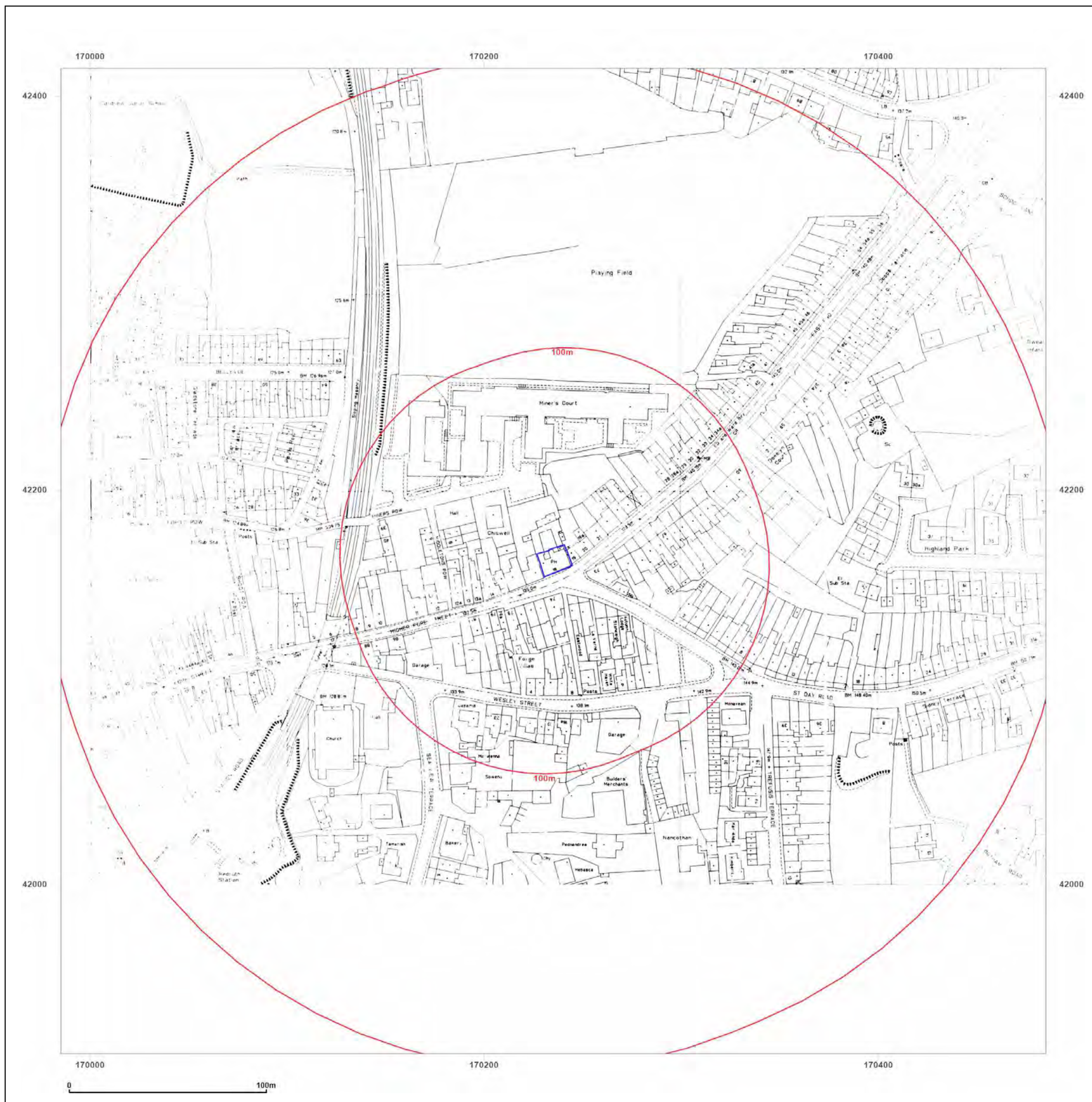
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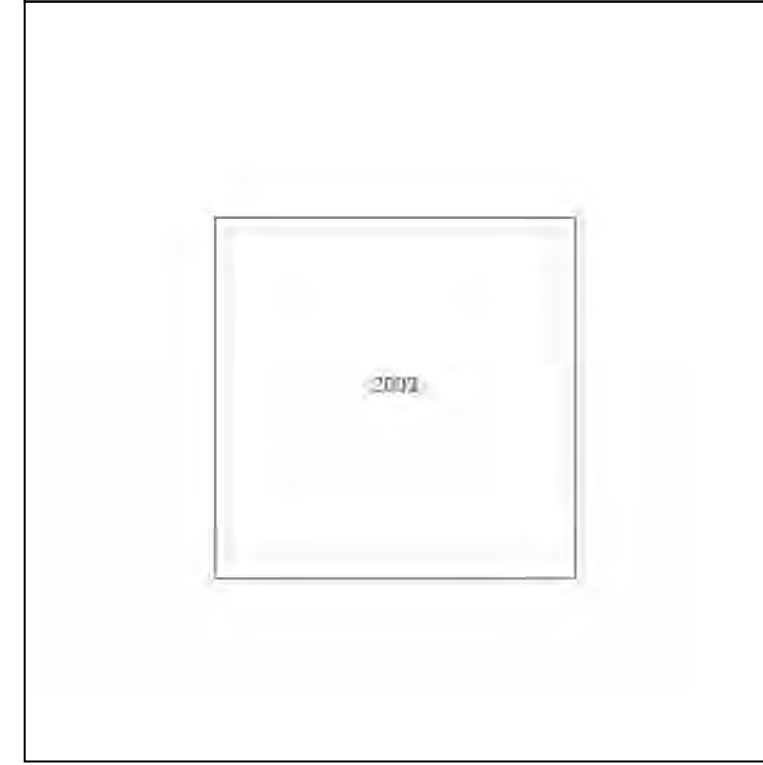
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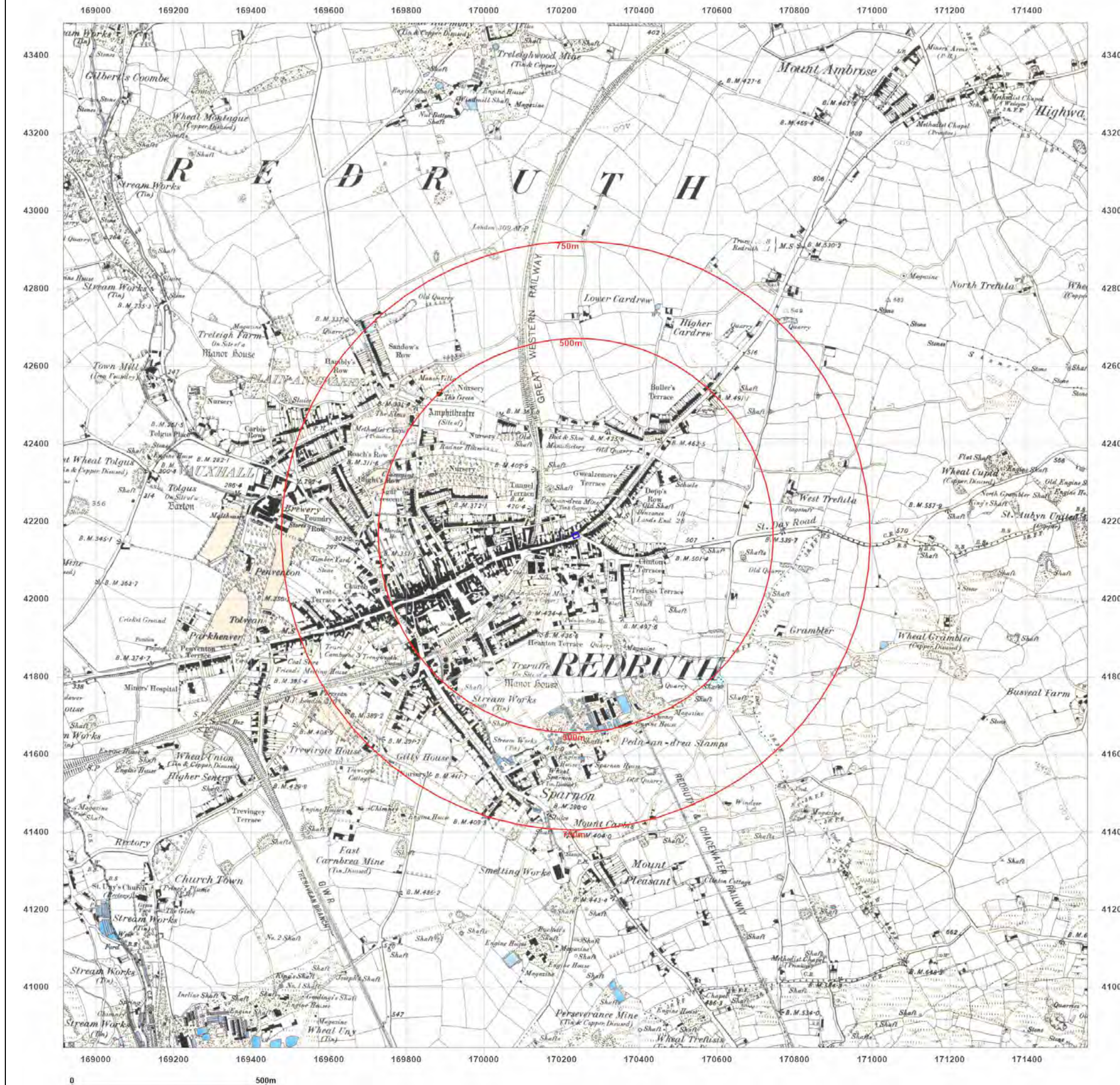
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Surveyed 1877  
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Edition N/A  
Copyright N/A  
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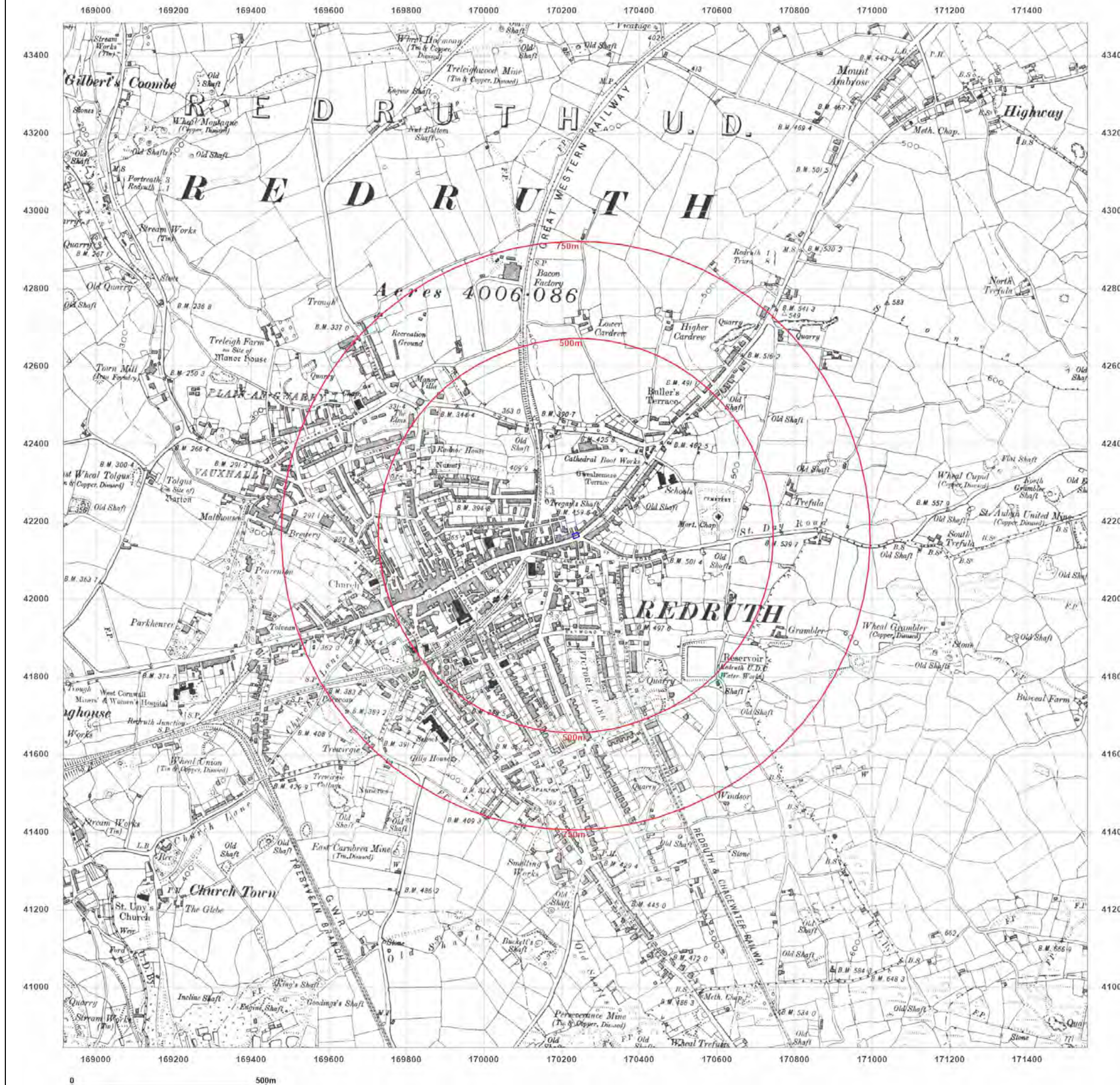
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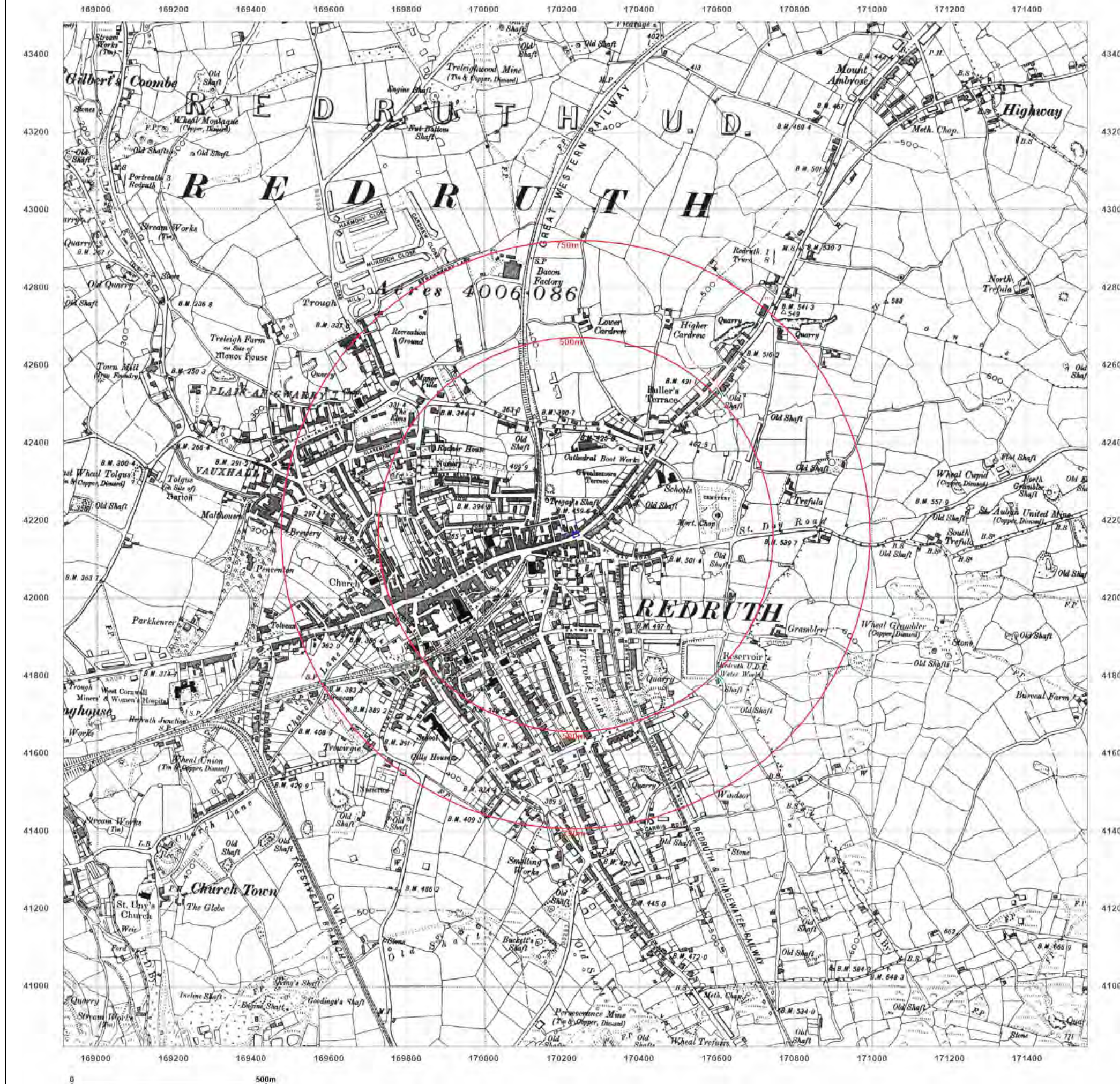
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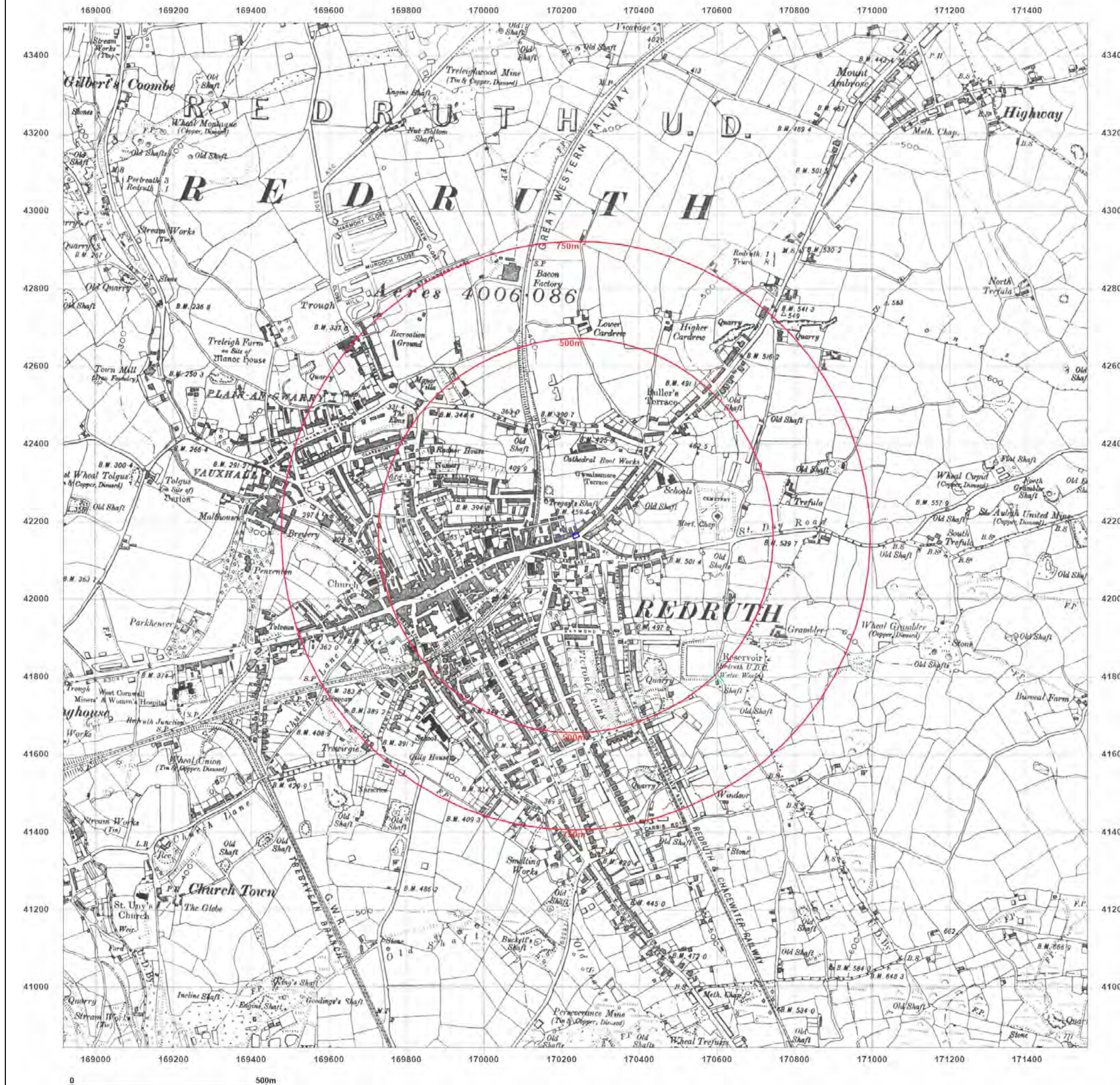
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 Edition N/A  
 Copyright N/A  
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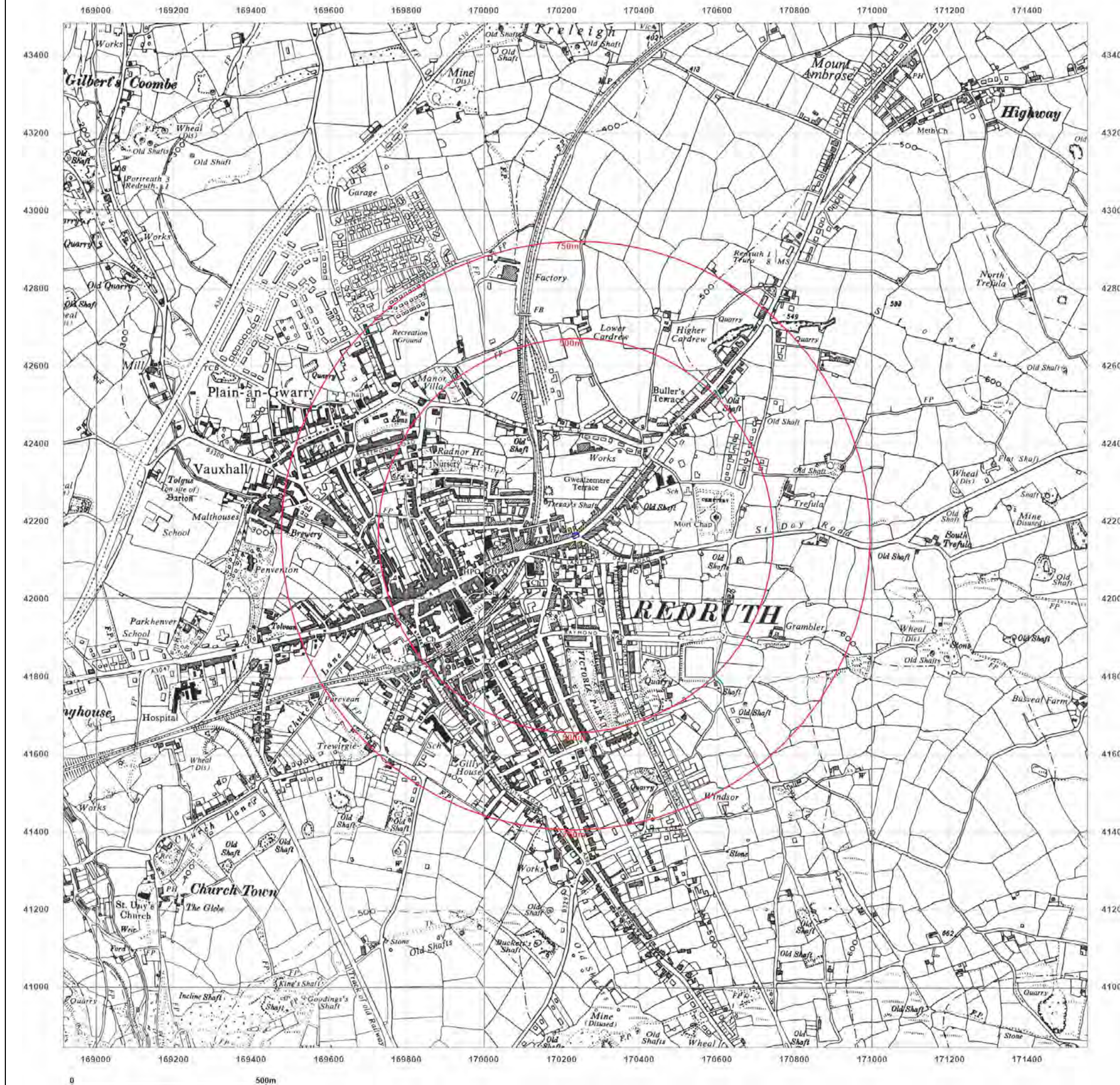
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Surveyed 1973  
Revised 1974  
Edition N/A  
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Levelled N/A



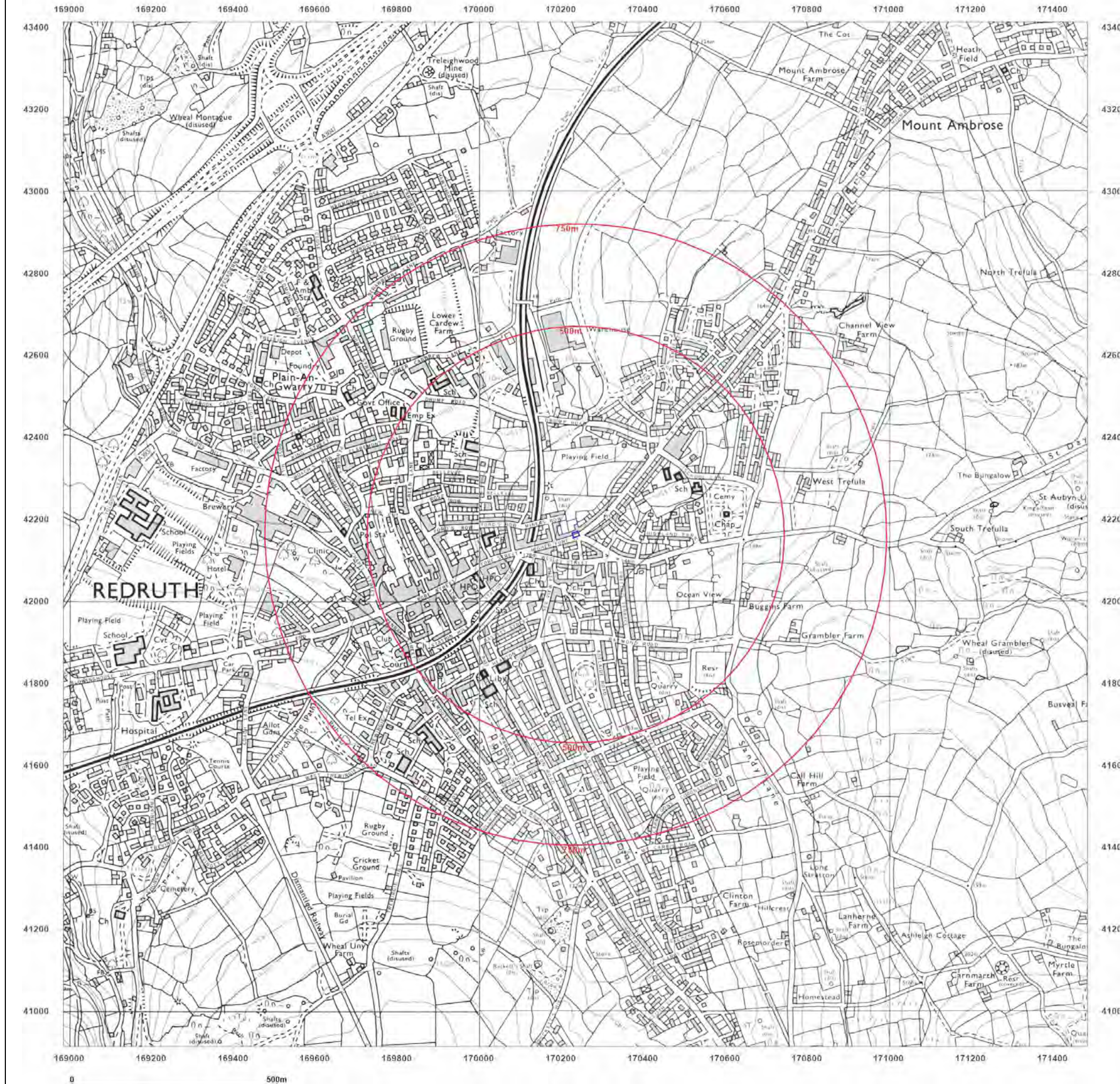
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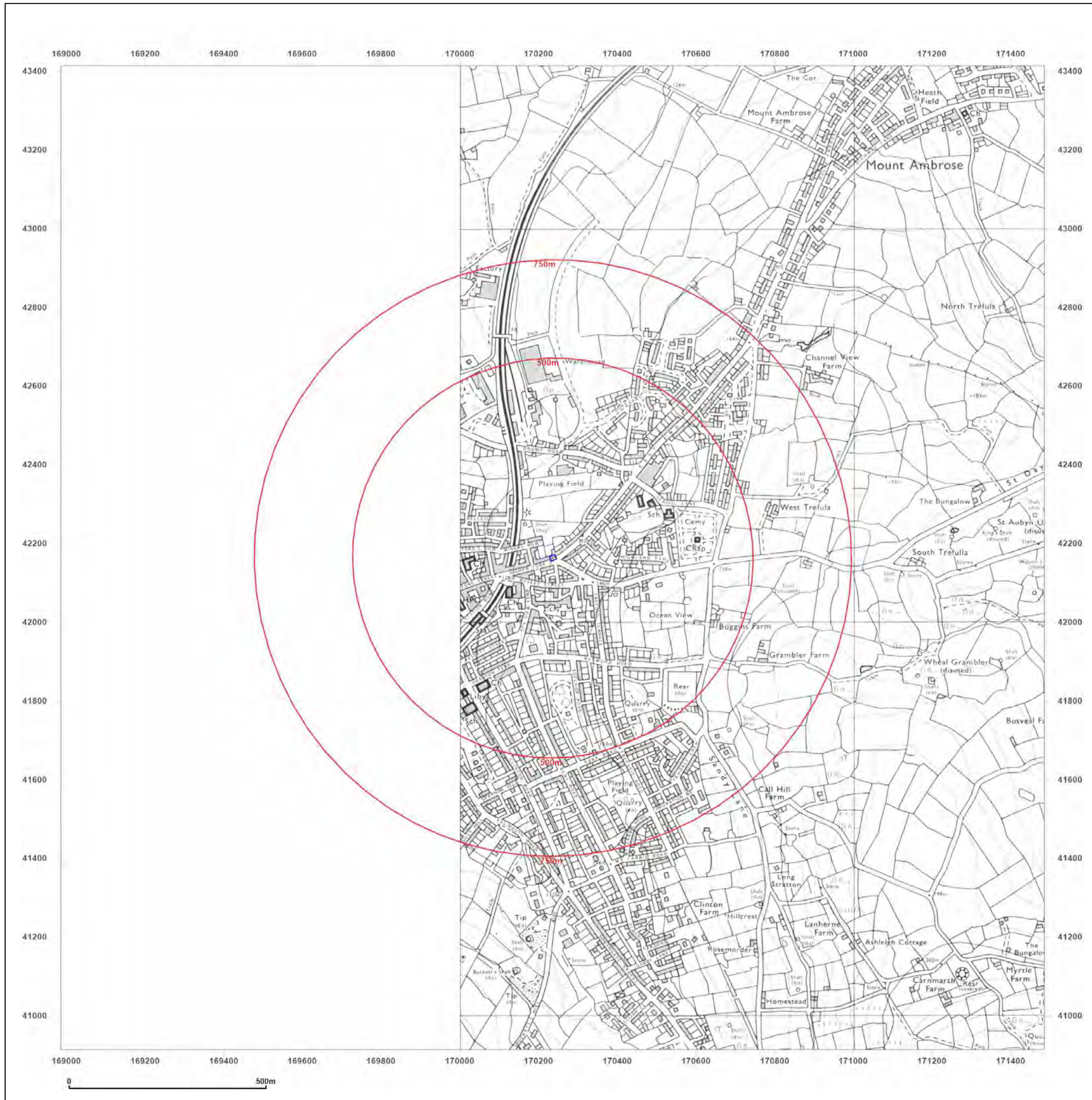


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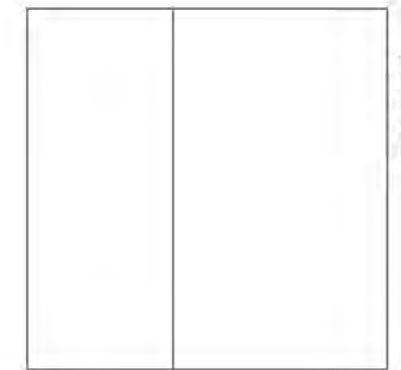
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Surveyed 1973  
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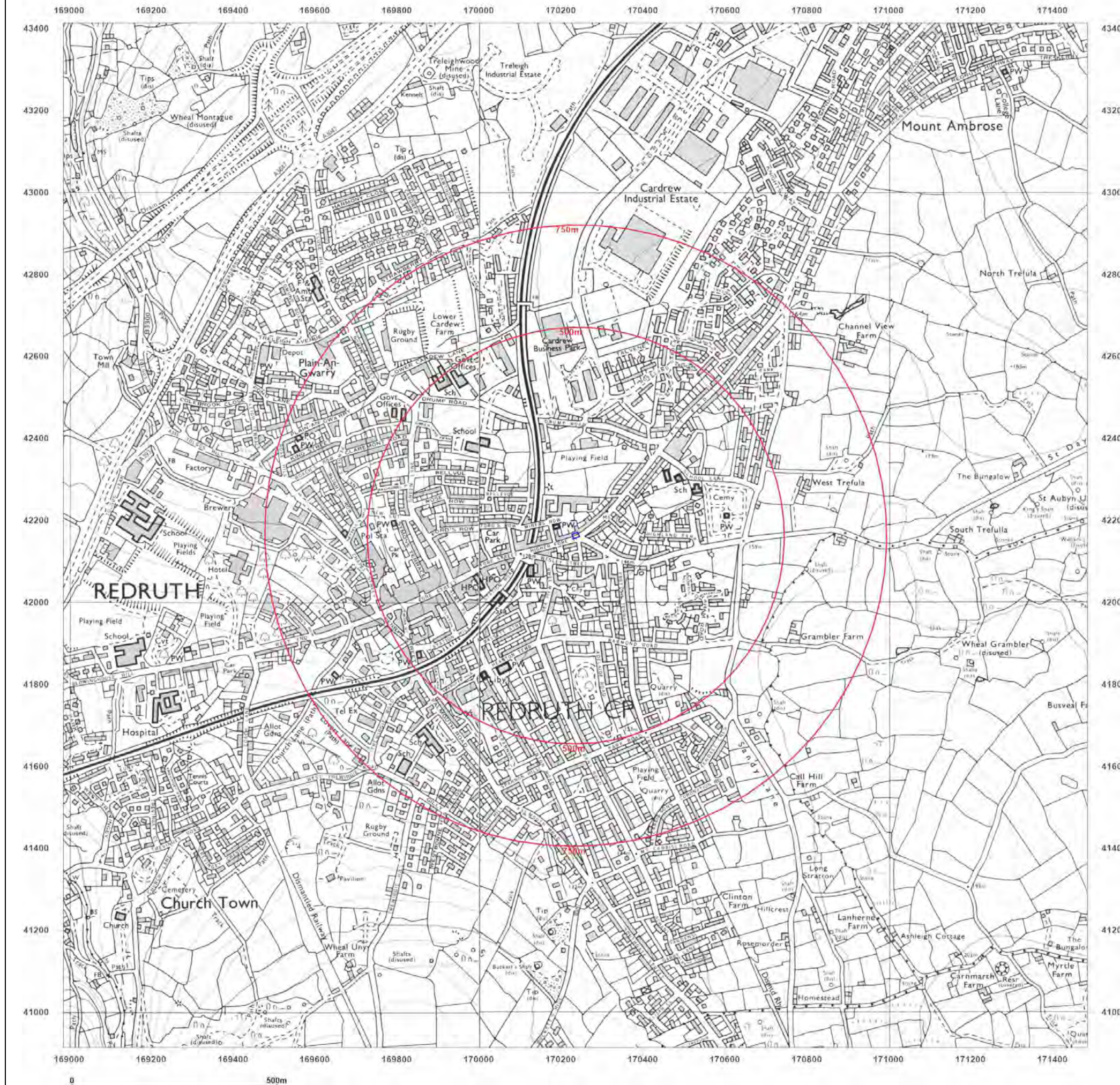
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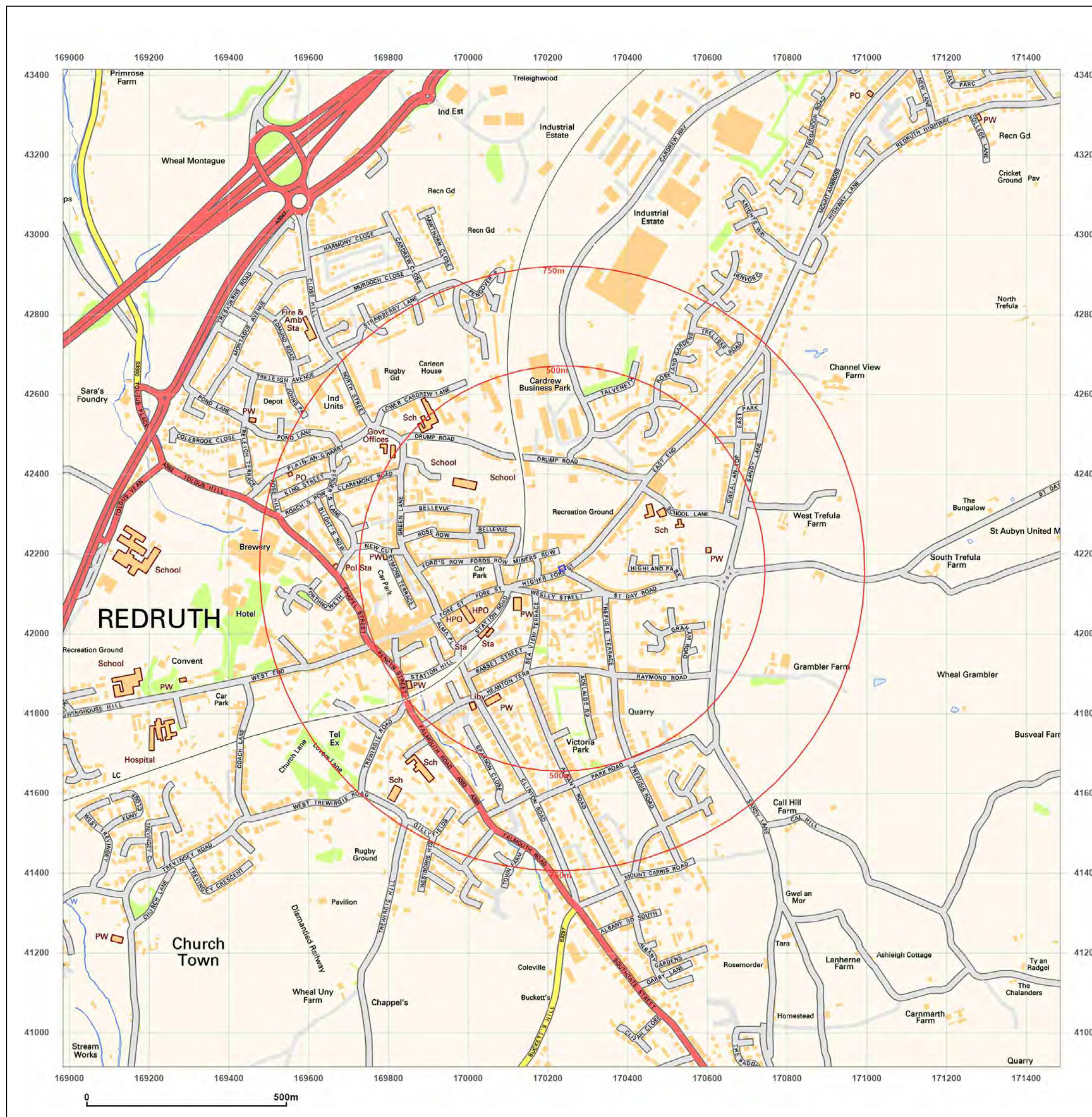
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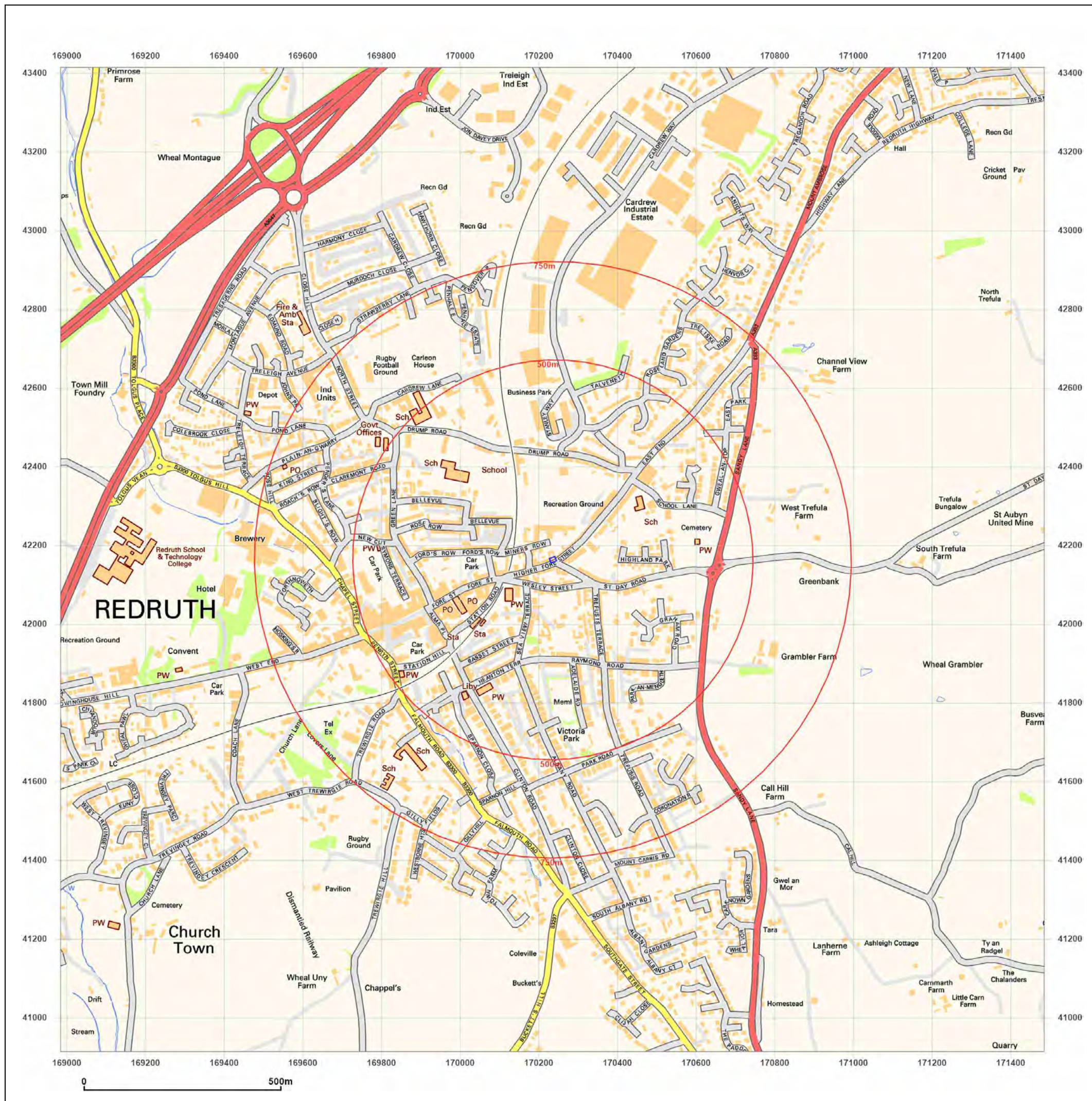
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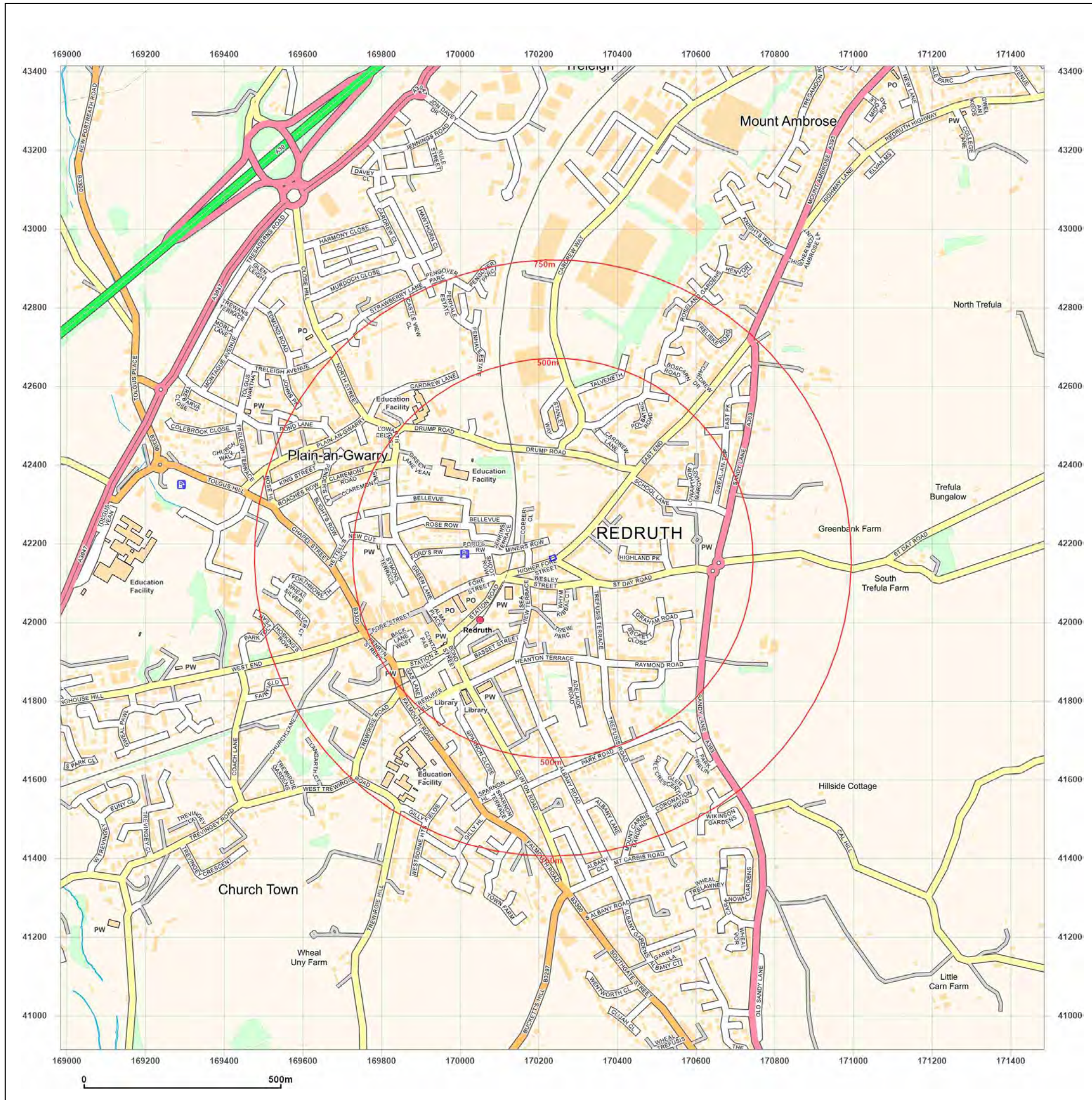
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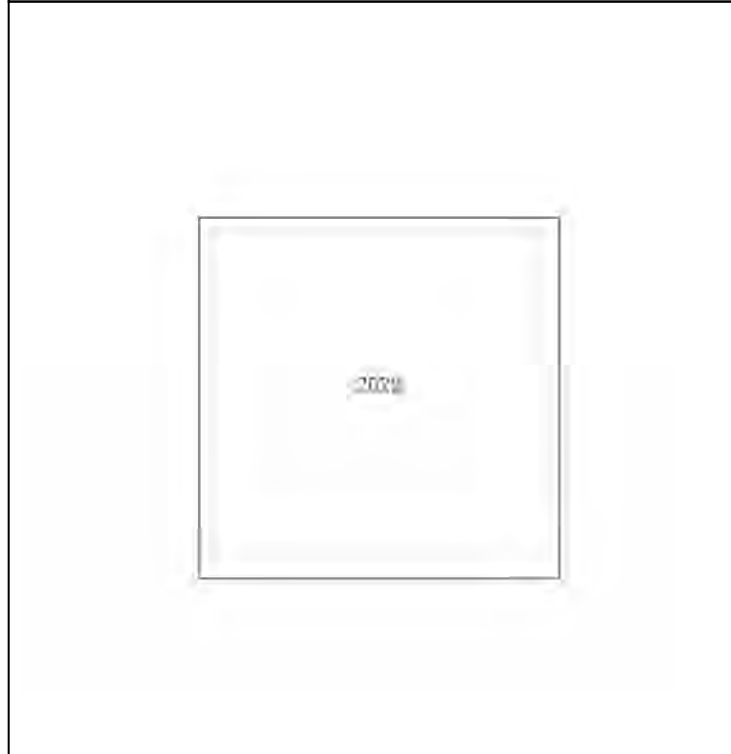
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# Appendix D

## UXO Risk Map



# UNEXPLODED BOMB RISK MAP



## SITE LOCATION

Location: TR15 2AP,  
Map Centre: 170209,42156



## LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- military
- industry
- UXO find
- transport
- dock
- Luftwaffe targets
- utilities
- Bombing decoy
- other

### How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment\* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment\* is necessary.

### What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

**Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.**

### If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

### If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

\*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

# Appendix E

## GeoRisk Report



COLLINS ARMS,18,HIGHER FORE STREET,REDRUTH, TR15 2AP

**Professional opinion**

**Site plan**



**ACTION  
REQUIRED**

There is an identified mining risk and further action is recommended. See guidance on **page 2**.



**Search results**



**Non-coal mining**  
**Further action**

page 4



**Historical features**  
**Identified**

page 4



**Geological features**  
**Identified**

page 4



**Oil and gas**  
**Identified**

page 4



**Satellite monitoring**  
Not identified



**Natural instability**  
Not identified



**Infilled land**  
Not identified



**Sinkholes**  
Not identified



**Coal mining alert**  
Not identified



**Cheshire brine alert**  
Not identified

Assesses mining risk from; **Stone, Clay, Metals, Evaporites** and **Hydrocarbons**

To save you time when assessing the report, we only provide maps and data tables of features we have identified to be of note.

You can view a full list of the information we have searched on **page 24**.

## Non-coal mining assessment



We consider there to be a non-coal mining-related risk to the property. Please refer to the assessment of mining experts Groundsure below for further details.



### Non-coal mining

Mining types: Metals, Stone, Unspecified

#### Past mining activity

The property lies within an historic metalliferous mining lease boundary.

A mineralised vein is recorded to pass through the property at surface outcrop.

A mineralised vein is inferred to pass close to the northern boundary of the property at surface outcrop. We have observed mine workings along the course of this mineralised vein in the local area.

A mineralised vein is recorded to pass through the property at an undefined elevation.

There is a possibility of unrecorded mining features associated with these mineralised veins within the property.

#### Current and future mining

According to our archive the property does not presently lie within an area with planning permission for non-coal mineral development. We are not aware of any planned future mining activity.

#### Next steps for consideration:

- It is therefore recommended that further action is carried out. This may take the form of a Site Investigation carried out by a suitably qualified and experienced person.

Contact our geology department at [geology@groundsure.com](mailto:geology@groundsure.com) or 01209 218861 to discuss options.

## Other considerations

Other ground hazards have been identified at the site. Please refer to the findings and recommendations below for further details. If the property is to be redeveloped, these findings should be used to inform geotechnical investigations at the site. Please also note, recommendations assume structures are present within the site boundary. If there are no structures or multiple structures present these recommendations should be treated appropriately.

## Energy

### Oil and gas

A record of planning applications relating to the exploration and extraction of oil or gas has been identified in the locality of the property, although not in close proximity. Some planning records may be identified as having been refused, but since been granted on appeal without appearing as such within the report. If any refused applications are identified within this report that would have a bearing on your decision as a purchaser if they had been granted, you are advised to check with the local authority on the application's status.

You may wish to use the planning application details given in the report to find out more about any applications. A better understanding of any impacts on the property may be achieved by contacting the operating company and/or Local Authority.

## Non-coal mining summary



### Mining records

Records relating to recorded mining areas or activity have been identified in the vicinity of the site.

See **page 6** for details. The Non-coal mining assessment on **page 2** will cover any next steps relating to these features, if applicable.

Mining features	Identified
Mine plans	Identified
Researched mining	Identified
BritPits	Identified
Mineral Planning Areas	Not identified
Non-coal mining areas	Identified
Mining cavities	Identified
Coal mining areas	Not identified
Brine areas	Not identified
Gypsum areas	Not identified
Tin mining areas	Identified

### Historical features

Historical mapping has identified mining features in the vicinity of the site.

See **page 14** for details. The Non-coal mining assessment on **page 2** will cover any next steps relating to these features, if applicable.

Non-coal mining	Identified
Coal and associated mining	Not identified
Industry associated with mining	Identified

### Geological features

There are geological features that could indicate the presence of mining operations in the area or other sources of ground instability.

See **page 19** for details. The Non-coal mining assessment on **page 2** will cover any next steps relating to these features, if applicable.

Artificial and made ground	Not identified
Mineral veins	Identified

### Oil and gas

Historical, active or planned wells or extraction areas have been identified near the property.

See **page 20** for details and **page 3** for recommended next steps.

Oil and gas areas	Not identified
Oil and gas wells	Identified

## Ground stability summary



### Satellite monitoring

Satellite radar measurements have not detected any notable ground movement in the vicinity of the property.

#### SatSense Rating

**Green**

Ratings provided by SatSense Ltd, experts in analysis of InSAR ground movement data from satellite radar.



### Natural instability

Searches of natural ground stability data have not identified any potential ground stability risks.

**Shrink-swell hazard**

**Non-Plastic**

**Natural ground subsidence**

**Not identified**

**Landslides**

**Not identified**

**Natural cavities**

**Not identified**

**Coastal erosion**

**Not identified**



### Infilled land

No recorded areas of infilled land or landfill have been identified in the vicinity of the site.

**Infilled land**

**Not identified**

**Historical landfill sites**

**Not identified**



### Sinkholes

No records of sinkholes have been identified in the vicinity of the property.

**Reported recent incidents**

**Not identified**

**Recorded incidents (BGS)**

**Not identified**

**Recorded incidents (Stantec)**

**Not identified**

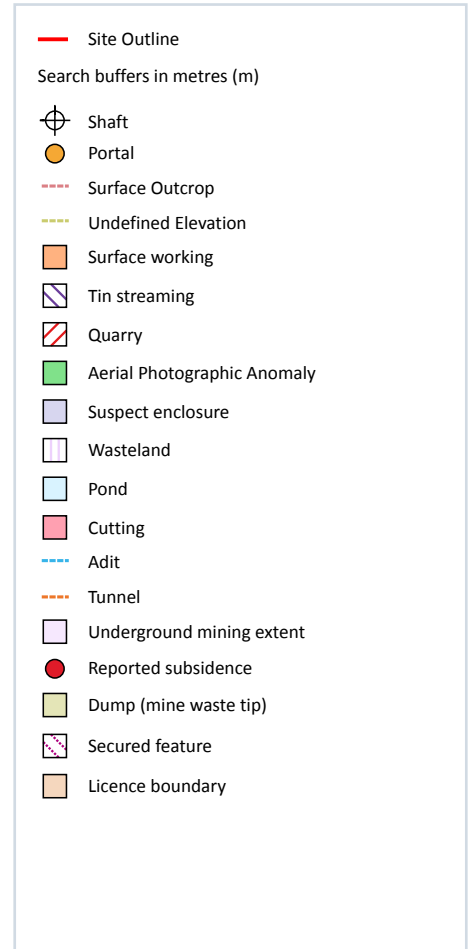
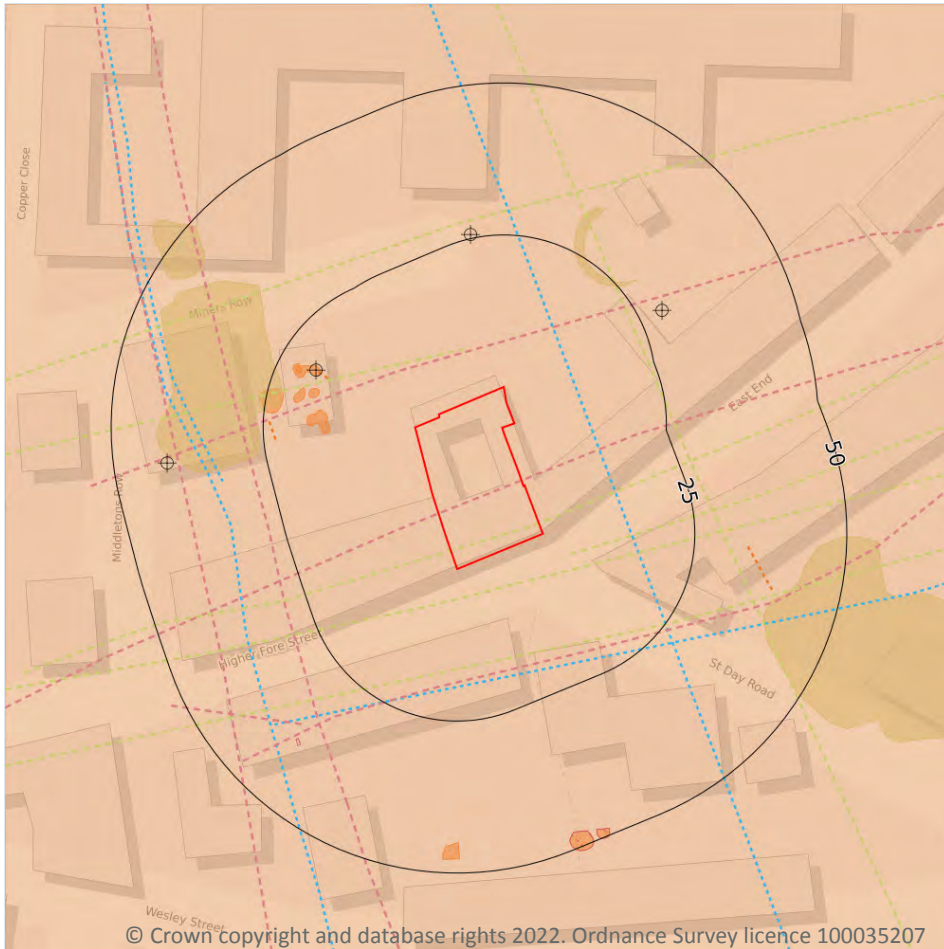
**Historical incidents**

**Not identified**





## Non-coal mining / Mining features



### Mine entries

Mine entries, including shafts and portals, identified from OS, BGS Geological mapping, Lidar data, and mine plans sourced from the BGS and various collections and sources.

Location	Feature	Mineral	Mining type
19m NW	Shaft	Copper	Metals
26m N	Shaft	Copper	Metals
29m NE	Shaft	Copper	Metals
41m W	Shaft	Copper	Metals

This data is sourced from Groundsure

### Mineralised veins

Mineralised veins identified from OS, BGS Geological mapping, Lidar data, and mine plans sourced from the BGS and various collections and sources.

Location	Feature	Mineral	Mining type
On site	Undefined elevation	Copper	Metals
5m W	Undefined elevation	Copper	Metals
6m E	Undefined elevation	Copper	Metals
8m W	Undefined elevation	Copper	Metals
16m W	Undefined elevation	Copper	Metals
23m N	Undefined elevation	Copper	Metals
28m NW	Undefined elevation	Copper	Metals
29m SW	Undefined elevation	Copper	Metals
On site	Surface outcrop	Copper	Metals
7m NE	Surface outcrop	Copper	Metals
18m E	Surface outcrop	Copper	Metals
28m NW	Surface outcrop	Copper	Metals
36m SW	Surface outcrop	Copper	Metals
39m SW	Surface outcrop	Copper	Metals
43m S	Surface outcrop	Copper	Metals

This data is sourced from Groundsure

## Surface workings

Surface workings identified from OS, BGS Geological mapping, Lidar data, and mine plans sourced from the BGS and various collections and sources.

Location	Feature	Mineral	Mining type
14m W	Surface working	Copper	Metals
17m NW	Surface working	Copper	Metals
18m NW	Surface working	Tin	Metals
19m NW	Surface working	Copper	Metals
21m NW	Surface working	Copper	Metals
22m W	Surface working	Copper	Metals
45m S	Surface working	Copper	Metals

Location	Feature	Mineral	Mining type
47m S	Surface working	Tin	Metals
48m S	Surface working	Tin	Metals

This data is sourced from Groundsure

## Underground mine workings

Underground mine workings presenting a potential risk, including adits and seam workings, identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

Location	Feature	Mineral	Mining type
11m NW	Adit	Copper	Metals
19m E	Adit	Copper	Metals
33m NW	Adit	Copper	Metals
33m SW	Adit	Copper	Metals
16m NW	Tunnel	Tin	Metals
23m W	Tunnel	Tin	Metals
34m E	Tunnel	Tin	Metals

This data is sourced from Groundsure

## Mine waste tips

Mine waste tips identified from OS, BGS Geological mapping, Lidar data, and mine plans sourced from the BGS and various collections and sources.

Location	Feature	Mineral	Mining type
23m W	Mine waste tip	Copper	Metals
23m NE	Mine waste tip	Copper	Metals
39m SE	Mine waste tip	Copper	Metals
44m NW	Mine waste tip	Copper	Metals

This data is sourced from Groundsure

## Secured features

Secured mining features identified from BGS Geological mapping and various collections and sources.

Location	Feature	Mineral	Mining type
38m SW	Secured feature	Copper	Metals

Location	Feature	Mineral	Mining type
47m S	Secured feature	Tin	Metals
48m S	Secured feature	Tin	Metals

This data is sourced from Groundsure

## Licence boundaries

Licensed boundaries identified from OS, BGS Geological mapping, and mine plans sourced from the BGS and various collections and sources.

Location	Feature	Mineral	Mining type
On site	Licence boundary	Copper	Metals

This data is sourced from Groundsure

## Researched mining

The property has been found to be either within or in proximity to areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured. Any such risk areas or features in the vicinity of the property are presented on the 'Mining features' map and within the detailed sections on Mine entries, Mineralised veins, Surface workings, Surface features, Underground mine workings or Mine waste tips.

This data is sourced from Groundsure

## Mining Record Office plans

The property has been found to be either within or in proximity to areas defined on Mining Record Office plans. This dataset is representative of Mining Record Office plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured. Any such risk areas or features in the vicinity of the property are presented on the 'Mining features' map and within the detailed sections on Mine entries, Mineralised veins, Surface workings, Surface features, Underground mine workings or Mine waste tips.

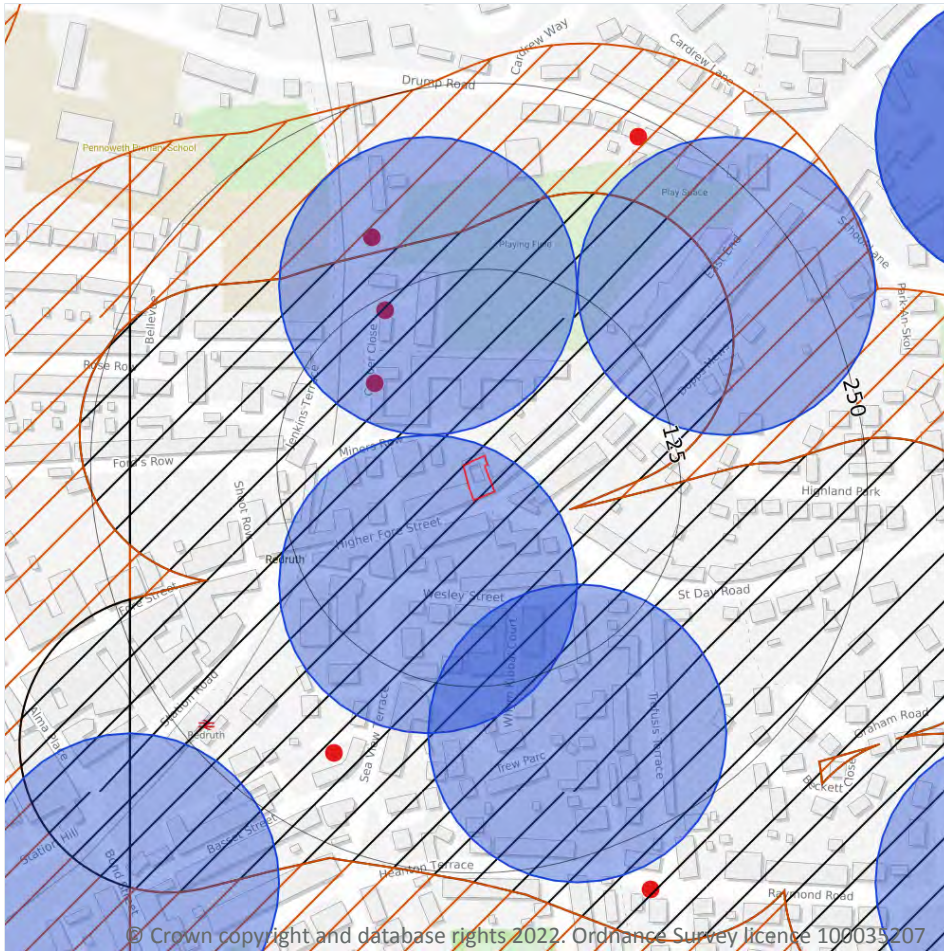
This data is sourced from Groundsure

## BGS mine plans

The property has been found to be either within or in proximity to areas defined on BGS mine plans. This dataset is representative of BGS mine plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk depicted have been captured. Any such risk areas or features in the vicinity of the property are presented on the Mining features map and within detailed sections on Mine entries, Mineralised veins, Surface workings, Surface features, Underground mine workings or Mine waste tips.

This data is sourced from Groundsure.

## Non-coal mining / Mining records



**— Site Outline**

**Search buffers in metres (m)**

- BritPits
- Historical Mineral Planning Areas
- Mining Cavities

**Non Coal Mining**

- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

### BritPits

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Location	Details	Description
81m NW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Copper Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

Location	Details	Description
81m NW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Tin Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
116m NW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Copper Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
116m NW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Tin Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
164m NW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Copper Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
164m NW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Tin Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

Location	Details	Description
193m SW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Copper Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
193m SW	Name: Pedn-an-drea Mine Address: REDRUTH, Cornwall Commodity: Tin Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
237m NE	Name: Gwealzemere Address: REDRUTH, Cornwall Commodity: Igneous & Metamorphic Rock Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

## Non-coal mining areas

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Location	Name	Commodity	Class	Likelihood
On site	Not available	Vein Mineral	E	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered

This data is sourced from the British Geological Survey.

## Mining cavities

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

Location	Mine Address	Mineral	Data source	Publisher
On site	Park-An-Skimmer, Redruth, Cornwall	Unknown	CORNWALL MINES DATABASE	UNPUBLISHED PRIVATE DOCUMENT.
20m N	An Drump, Redruth, Cornwall	Unknown	CORNWALL MINES DATABASE	UNPUBLISHED PRIVATE DOCUMENT.
71m S	Pednandrea United, Redruth, Cornwall	Bornite, Chalcocite, Copper, Malachite, Native Copper, Tetrahedrite	CORNISH MINES (METALLIFEROUS AND ASSOCIATED MINERALS 1845- 1913)	UNIVERSITY OF EXETER
98m NE	Dopps Mine, Redruth, Cornwall	Unknown	CORNWALL MINES DATABASE	UNPUBLISHED PRIVATE DOCUMENT.
245m SW	Redruth, Cornwall	Cassiterite, Tin, Tinstone	-	-

This data is sourced from Stantec UK Ltd.

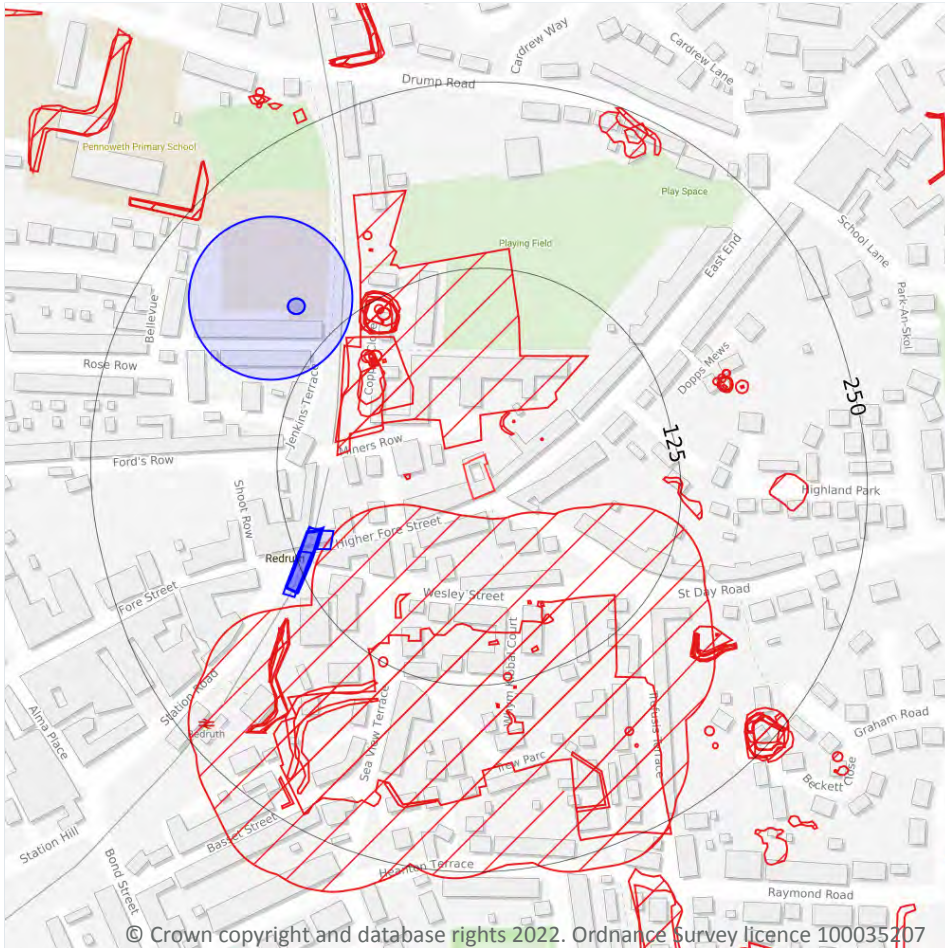
## Tin mining areas

The property is within a generalised area that may be affected by tin mining.

This data is sourced from Groundsure.



## Non-coal mining / Historical features



- Site Outline
- Search buffers in metres (m)
- Non-coal mining
- Coal and associated mining
- Industry associated with mining

### Non-coal mining

Historical land uses identified from Ordnance Survey mapping that involved mining for substances other than coal.

Location	Land use	Date
10m N	Tin and Copper Mine	1880
12m S	Tin and Copper Mine	1879
20m NE	Ground Workings	1880
29m NE	Shaft	1880
36m W	Shaft	1880
39m E	Shaft	1908

Location	Land use	Date
53m NW	Tin and Copper Mine	1879
66m NW	Unspecified Pit	1880
72m NW	Unspecified Heap	1879
77m SW	Ground Workings	1880
77m S	Shaft	1908
80m S	Tin and Copper Mine	1880
82m S	Shaft	1880
86m NW	Shaft	1908
88m NW	Shaft	1880
88m NW	Disused Shaft	1968
89m NW	Disused Shaft	1970
90m NW	Unspecified Disused Shaft	1980
90m NW	Unspecified Disused Shaft	1974
90m SE	Ground Workings	1880
92m NW	Unspecified Shaft	1906
93m NW	Unspecified Shaft	1938
96m S	Engine Shaft	1880
100m NW	Unspecified Heap	1938
101m NW	Ground Workings	1968
102m NW	Ground Workings	1970
102m NW	Ground Workings	1986
102m NW	Ground Workings	1989
102m NW	Unspecified Shaft	1958
105m NW	Unspecified Heap	1906
105m NW	Unspecified Heap	1879
107m S	Shaft	1880
109m NW	Shaft	1880
110m NW	Unspecified Disused Shaft	1992

Location	Land use	Date
110m NW	Unspecified Disused Shaft	1980
110m NW	Unspecified Disused Shaft	1974
113m E	Ground Workings	1880
116m NW	Unspecified Shaft	1879
119m S	Unspecified Shaft	1879
122m SW	Shaft	1880
128m S	Shaft	1880
138m S	Shaft	1880
139m SW	Unspecified Ground Workings	1879
143m S	Ground Workings	1880
148m SW	Ground Workings	1880
149m SW	Ground Workings	1968
149m SW	Ground Workings	1989
149m SW	Ground Workings	1994
155m SW	Ground Workings	1908
155m NW	Shaft	1880
161m E	Unspecified Old Shaft	1958
163m E	Unspecified Pit	1986
163m E	Unspecified Pit	1989
163m E	Unspecified Pit	1994
163m NW	Unspecified Shaft	1879
164m SE	Unspecified Heap	1879
164m E	Unspecified Old Shaft	1938
164m E	Unspecified Pit	1970
164m E	Unspecified Pit	1968
165m SE	Ground Workings	1986
165m SE	Ground Workings	1989
165m SE	Ground Workings	1994

Location	Land use	Date
166m SE	Ground Workings	1970
166m E	Old Shaft	1880
167m SE	Ground Workings	1968
168m SE	Ground Workings	1908
168m E	Unspecified Old Shaft	1906
168m E	Unspecified Old Shaft	1879
174m E	Unspecified Pit	1908
177m SE	Old Shaft	1908
177m E	Old Shaft	1908
182m S	Ground Workings	1880
182m SE	Unspecified Shaft	1879
184m E	Unspecified Pit	1880
195m SE	Shaft	1880
199m S	Ground Workings	1880
213m SE	Unspecified Shaft	1879
222m NE	Old Quarry	1880
224m SE	Shaft	1880
227m SE	Unspecified Ground Workings	1879
227m SW	Ground Workings	1880
229m SE	Ground Workings	1986
229m SE	Ground Workings	1989
229m SE	Ground Workings	1970
230m SE	Ground Workings	1968
231m SE	Ground Workings	1908
231m NE	Unspecified Old Quarry	1879
231m NE	Ground Workings	1908
234m SE	Ground Workings	1880
234m SE	Ground Workings	1968

Location	Land use	Date
234m SE	Ground Workings	1989
242m SE	Unspecified Ground Workings	1906
242m NW	Ground Workings	1994
242m NW	Ground Workings	1986
242m NW	Ground Workings	1989

This data is sourced from Groundsure.

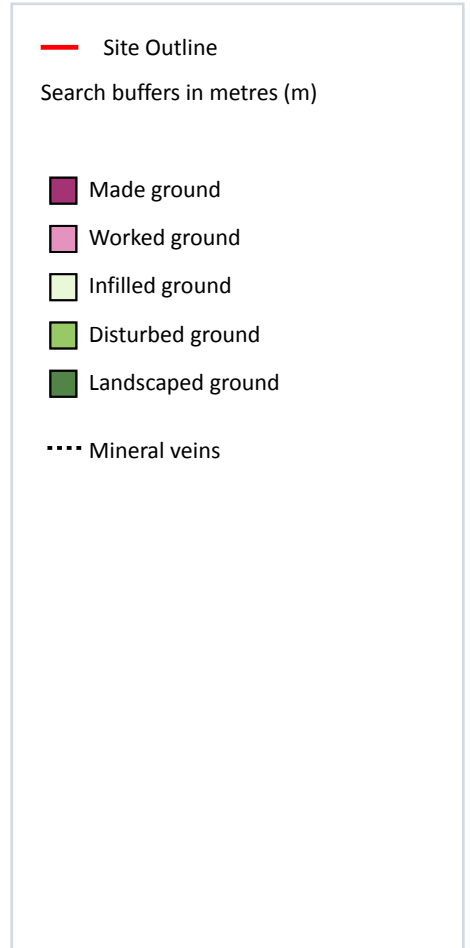
## Industry associated with mining

Historical land uses identified from Ordnance Survey mapping that indicate the presence of industry which was often associated with mineral extraction. Extraction sites were often located in close proximity to these land uses.

Location	Land use	Date
96m W	Tunnel	1908
102m W	Tunnel	1968
103m W	Tunnel	1970
103m W	Tunnel	1994
104m W	Tunnel	1986
104m W	Tunnel	1989
114m W	Tunnel	1908
116m NW	Tunnel	1879
149m NW	Tunnel	1880
149m NW	Tunnel	1908

This data is sourced from Groundsure.

## Non-coal mining / Geological features 50k



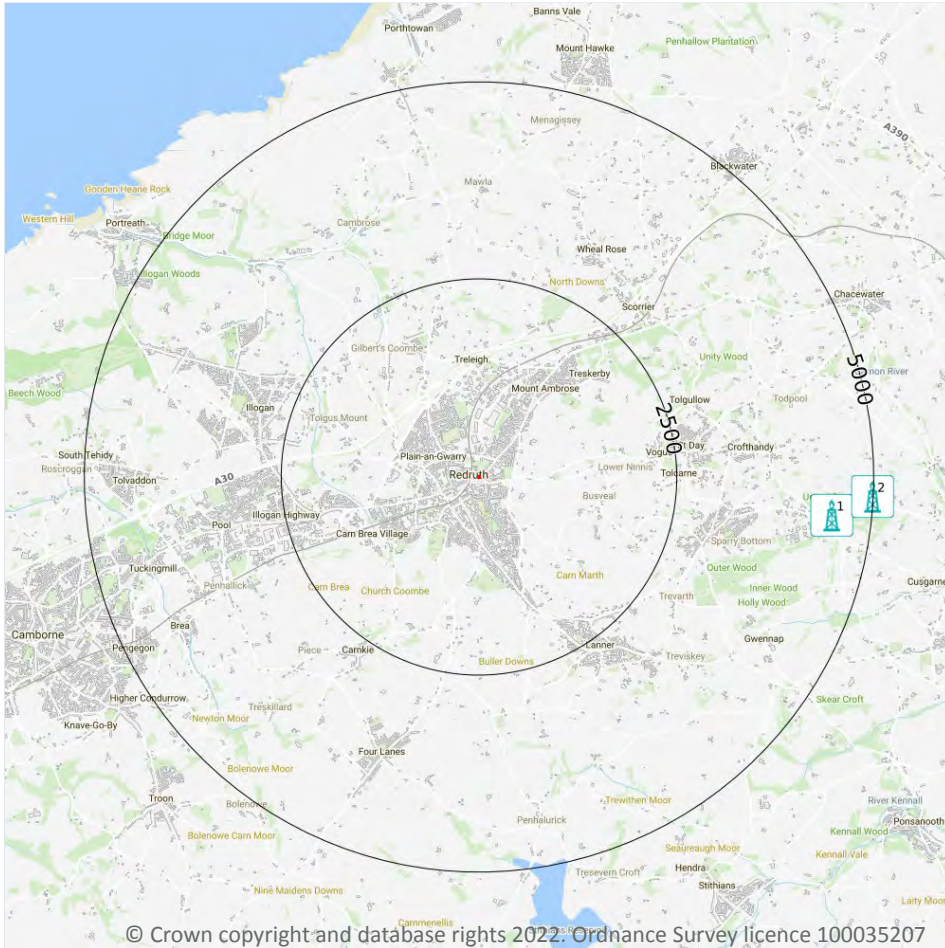
### Linear features - mineral veins (50k)

Detail of linear features such as mineral veins identified from geological maps at 1:50,000 scale. The presence of mineral veins in the area is an indicator that mining operations may have occurred in the area.

Location	Category	Description
125m S	MINERAL_VEIN	Mineral vein, inferred

This data is sourced from the British Geological Survey.

## Non-coal mining / Oil and gas



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### Proposed oil or gas drilling well

Planning applications relating to the exploration and extraction of oil or gas. Please be aware this may also include applications for subsurface geological exploration unrelated to fuel extraction.

ID	Distance	Direction	Details
1	4-5 km	E	<p>Location: Site 1 PC Tonkin Recorvery, Site 2 Lasermaster Ltd, Site 3 Cornwall Council Land, Site 4 Tregarlands Farm, Site 5 United Downs Farm, United Downs Industrial Park/United Downs St Day, Redruth, Cornwall, TR16 5HY</p> <p>Applicant: -</p> <p>Application Type: Awaiting decision</p> <p>Application Date: 02/03/2021</p> <p>Application Reference: PA21/02353</p>

Submission by South Crofty Ltd as formal notification to the Mineral Planning Authority (MPA) to carry out a programme of exploration drilling on land in the United Downs area, Gwennap - under the provisions of Part 17 Class K of the Town and Country Planning (General permitted Development) (England) Order 2015

ID	Distance	Direction	Details	
2	4-5 km	E	Location: Land At United Farm, United Mines, St Day, Redruth, Cornwall, TR16 5HX Applicant: South Crofty Ltd Application Type: Awaiting decision Application Date: 14/02/2022 Application Reference: PA22/01536	Notification under Town and Country Planning (General Permitted Development) (England) Order 2015 under Part 17 Class K for a mineral exploration via a diamond drilling program.

This data is sourced from Glenigan.



## Datasets searched

This is a full list of the data searched in this report. If we have found results of note we will state "Identified". If no results of note are found, we will state "Not identified". Our intelligent filtering will hide "Not identified" sections to speed up your workflow. Please note: if a GeoRisk + report, the CON29M and Cheshire Salt Search content is not covered in the below.

<b>Mining features</b>		<b>Historical Features</b>	
Mine entries	Identified	Non-coal mining	Identified
Mineralised veins	Identified	Coal and associated mining	Not identified
Surface workings	Identified	Industry associated with mining	Identified
Surface features	Not identified	<b>Geological features</b>	
Underground mine workings	Identified	Artificial and made ground (10k)	Not identified
Reported subsidence	Not identified	Linear features - mineral veins (10k)	Not identified
Mine waste tips	Identified	Artificial and made ground (50k)	Not identified
Secured features	Identified	Linear features - mineral veins (50k)	Identified
Licence boundaries	Identified	<b>Oil and gas</b>	
Researched mining	Identified	Oil or gas drilling well	Not identified
Mining Record Office plans	Identified	Proposed oil or gas drilling well	Identified
BGS mine plans	Identified	Licensed blocks	Not identified
<b>Mining records</b>		Potential future exploration areas	Not identified
BritPits	Identified	<b>Satellite monitoring</b>	
Mineral Planning Areas	Not identified	Satellite monitoring	Not identified
Non-coal mining areas	Identified	<b>Natural instability</b>	
Mining cavities	Identified	Property shrink-swell assessment	Not identified
Coal mining areas	Not identified	Shrink-swell clays	Not identified
Brine areas	Not identified	Landslides	Not identified
Gypsum areas	Not identified	National landslide database	Not identified
Tin mining areas	Identified	Running sands	Not identified

## Natural instability

Compressible deposits	Not identified
Collapsible deposits	Not identified
Dissolution of soluble rocks	Not identified
Natural cavities	Not identified

## Coastal Erosion

Projections with intervention measures in place	Not identified
Projections with no active intervention	Not identified

## Infilled land

Infilling from historical mapping	Not identified
Active landfill sites	Not identified
Historical landfill (from Environment Agency records)	Not identified
Historical landfill (from Local Authority and historical mapping records)	Not identified

## Sinkholes

Reported recent incidents	Not identified
Recorded incidents (BGS)	Not identified
Recorded incidents (Stantec)	Not identified
Historical incidents	Not identified

## Notes and guidance

### Summary of potential report outcomes

#### Action required

There is an identified mining risk and further action is recommended.

- based on all available mining data further mining investigation is required
- the client should be informed of the recommended actions
- depending on the outcome of recommended actions, the identified issues may need to be reported to the lender if stipulated in their particular requirements

#### Potential risk

There is an identified risk but no further investigation is recommended.

- data indicates the potential for coal mining related issues (GeoRisk + only) or the property is at risk of coastal erosion
- the client should be informed of the recommended actions

Please note, there are niche scenarios within the CON29M element of the GeoRisk + report for which a Potential risk outcome may be presented for which further action may be required.

#### Pass with guidance

There is an identified potential for ground movement but it is unlikely to impact the transaction.

- if a survey has been undertaken at the property that considers ground instability and no issues were found, no further action is required
- however, based on the findings of this report, the purchaser should be encouraged to consider potential instability in any future development or alteration of the ground including planting and removing trees, and regardless of the survey outcome
- if no survey has yet been undertaken, we recommend one is carried out by a suitably qualified and experienced person
- if ground instability issues have been or are subsequently identified in a survey we recommend following any advice given in the survey findings

#### Pass

No ground hazards have been identified at the site within the scope and limitations of the report.

### Non-coal mining assessment

This mining search has been compiled from the archive information held by Groundsure. As with all historic mining records, there is no guarantee or assurance of reliability or accuracy of these records. Not all mining activities were recorded or are publically available. Groundsure can't be held responsible for any omissions or errors in the information upon which our interpretation has been based.

Historical mining records vary in document age, reliability, reproduction, quality of the original record, the reason to produce the original document, the skill of the original surveyor and the accuracy of the available surveying equipment at the time of production. It must be accepted that the information is subject to

interpretation. Alternative interpretations may be possible.

In any area, sporadic, un-surveyed and ancient mine workings can exist, and unrecorded mine workings or mineralised veins can never be ruled out. Groundsure cannot be held responsible for any settlement or subsidence associated with unrecorded mining features, or from mining plans that are not publically available.

If the property or site is subject to future development we recommend that the ownership of the minerals below the site's surface is established. This detail may be sought from a legal adviser or via the Land Registry. You can then assess whether there is a possibility of any proposed development disturbing or trespassing upon any minerals in third party ownership at the site.

In addition, a mining site investigation may be required to satisfy planning or building regulation conditions. Contact Groundsure for further advice.

## Coal Authority data

This report contains Data provided by the Coal Authority. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure Limited and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure Limited prior to any re-use.

## Satellite monitoring

SatSense produces countrywide ground movement products based on satellite radar data. For property movement products in the UK we use data from the ESA Sentinel-1 satellite constellation, which has a resolution of 4 by 14 metres. This means that the smallest objects we can detect are the size of a large shed, and we often get multiple measurement points over individual houses. We receive a new radar image every six days, and data collection started in 2015 (although initially, acquisition frequency was lower). This means we have 250+ measurements in time everywhere in the UK. By analysing this long time history using a technique known as InSAR, we can detect long-term movements as low as 1 mm/yr, which is far below movement levels expected to cause property damage.

What is InSAR?

Interferometric Synthetic Aperture Radar (InSAR) is a processing technique that uses the difference between radar images to detect ground movements with high precision. Two (or more) radar images are overlaid such that they match exactly, and the radar measurements for every matching pixel in the images are differenced. The phase information from this difference is then used to extract ground movement for every pixel. SatSense processes all available data over the United Kingdom.

Why can't we measure everywhere?

A limitation of InSAR is that it relies on consistent radar returns from the reflecting surface (buildings, fields, woodland). While some types of surfaces, like buildings, bridges and bare ground are naturally very consistent, ground cover like dense vegetation and fast-growing crops inherently can vary rapidly over time and therefore interfere with the radar measurement. During our processing, we detect which points provide usable measurements, and which points have had too much interference. This means coverage is variable; dense in urban areas, but much more sparse in rural areas.

Why do we need risk indices?

The SatSense ground movement product measures a wide range of ground movements, from long-term, large regional signals to event level movement of individual points. Not all movements have the same damage potential for buildings. Compare an entire town that is subsiding due to groundwater variations to a single building subsiding due to local instability. Buildings in the subsiding town are all moving at very similar rates, meaning there is little to no relative movement between them. This makes the potential for damage much lower than the individual building moving with respect to its neighbours.

To differentiate between different types of movements, we've developed a way to extract different types of movements that are potentially damaging to property. This information is captured by the SatSense risk indices. These risk indices are described below:

- **Property** - This shows any long-term differential movement of the property with respect to its immediate surroundings, in other words, very localised movements. Examples of processes that could flag up this risk index would be trees affecting the nearby water table, local ground instability and small scale nearby building work.
- **Surrounds** – Focuses on slightly larger scale movements, how is the street or estate moving with respect to the wider area. Examples of processes that could flag up this risk index are tunnelling, large scale nearby building work and groundwater extraction.
- **Local Area** - Our widest scale index, showing how a town/neighbourhood as a whole is moving. This index is normally flagged up due to the presence of large scale historic mining or large scale groundwater extraction. Due to the wide area and the limited potential for damage likely to be associated with this type of movement, this index will only indicate amber or green, never red.
- **Gradient** – Looks for bending over medium spatial scales. This index will flag up properties that might not be moving much themselves but are being affected by movements in the vicinity.
- **Acceleration** - Looks at the recent changes in movements, flagging up properties that might not have historically been moving, but have recently seen an increase. It also provides information on whether properties that have moved historically continue to move, or whether the movement is decreasing.
- **Range** – Looks at the amplitude of movement over time. This will highlight periodic (seasonal) movements, and event style movements like sinkholes.

## National Coastal Erosion Risk Mapping (NCERM)

The National Coastal Erosion Risk Mapping (2018-2021) shows the coastal baseline. This baseline is split to 'frontages'. These are defined as lengths of the coast with consistent characteristics based on the cliff behaviour characteristics and the defence characteristics. It is intended as an up-to-date and reliable benchmark dataset showing erosion extents and rates for three periods:

- Short Term (0 – 20yr);
- Medium Term (20 – 50yr); and
- Long Term (50 – 100yr).

For the 5th, 50th and 95th percentile confidence levels (degrees of certainty, where 95th percentile equates to 95% certainty) for:

- No Active Intervention Policy Scenario; and
- With the implementation of Shoreline Management Plan (SMP) 2 Policies.

Defence type and SMP policies for each of the three periods described above are included.

The data and associated information is intended for guidance - it cannot provide details for individual properties. The NCERM information considers the predominant risk at the coast, although flooding and erosion processes are often linked, and data on the erosion of foreshore features are, in general, not included.

The data describes the upper and lower estimates of erosion risk at a particular location, within which the actual location of the coastline is expected to lie. The data does not estimate the absolute location of the future coastline. Details of geologically complex areas, known as "complex cliffs" are, in general, not included within the dataset due to the inherent uncertainties associated with predicting the timing and extent of erosion at these locations.

This dataset succeeds National Coastal Erosion Risk Mapping (NCERM) - National (2012 - 2017) Attribution statement: © Environment Agency copyright and/or database right

## BGS Property Shrink Swell Assessment

This dataset uses OS Open Maps building polygons to derive its assessment. These are often representative of more than one building and so the score assigned is representative of the highest risk found within the connected building units e.g. a pair of semi-detached properties or a terraced row. The baseline mapping used to derive the assessment will be updated at least annually.

The assessment does not cover any man-made hazards and is based on, and limited to the input datasets including OS Open Buildings, Office for National Statistics data, Bluesky Tree Map and BGS GeoSure shrink-swell. An indication of natural ground instability related to shrink-swell does not necessarily mean that a location will definitely be affected by ground movement or subsidence. Such an assessment can only be made by inspection of the area by a qualified professional.

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- Compliance with the Conveyancing Information Executive Standards will be a condition within the Conveyancing Information Executive Member's Terms and Conditions.
- Conveyancing Information Executive Members will promote the benefits of and deliver the Search to the agreed standards and in the best interests of the customer and associated parties.

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- acknowledge it within 5 working days of receipt
- normally deal with it fully and provide a final response, in writing, within 20 working days of receipt
- liaise, at your request, with anyone acting formally on your behalf

Complaints should be sent to:

Operations Director, Groundsure Ltd, Sovereign House, Church Street, Brighton, BN1 1UJ. Tel: 08444 159 000. Email: [info@groundsure.com](mailto:info@groundsure.com) If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: [admin@tpos.co.uk](mailto:admin@tpos.co.uk) We will co-operate fully with the Ombudsman during an investigation and comply with their final decision.

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# Appendix F

## Mining Investigation







WESTCOUNTRY MINES  
& PROPERTY SURVEYS

MINING SUBSIDENCE CONSULTANTS  
Grove Farm, East Hill, Blackwater, Truro, Cornwall TR4 8EG  
Tel & Fax: 01872 562837 E-mail: info@westcountrymines.co.uk

A Report on a Site Investigation carried out at:

Collins Arms  
18 Higher Fore Street  
Redruth,  
Cornwall.  
TR15 2AP

N.G.Ref: SW 7023 4216

For:

Mr M.T. Whatley  
Collins Arms  
18 Higher Fore Street  
Redruth,  
Cornwall.  
TR15 2AP

Re-Assigned To:-  
Mr M J Baker & Miss E J Favata  
c/o Coodes Solicitors  
49-50 Morrab Road  
Penzance  
Cornwall TR18 4EX

Report Ref: 67774

Date: July 2021

Completed by N.A.Pettett B.Eng. (Hons) ACSM

**Re-Assignment Date: 9<sup>th</sup> August 2022**

**Our Ref: 68921**

## **1.0 Introduction**

1.1 This Site Investigation in respect of historic metalliferous mining activity has been carried out by Westcountry Mines and Property Surveys.

1.2 This report is confidential to the clients, the mortgage provider and any other professional advisors acting for or on behalf of the clients, and is specific to the subject property only. This report cannot be used for any purpose other than to that intended.

1.3 The objective of this investigation was to ascertain the presence or otherwise of any deleterious mining features, likely to present a risk to the property at:

Collins Arms  
18 Higher Fore Street  
Redruth,  
Cornwall.  
TR15 2AP

## **2.0 Location and Geology**

2.1 The property, which comprises of a terraced public house, is situated in the central part of the town of Redruth, in the county of Cornwall. Throughout this report the reader is referred to the maps, plans and drawings (Figures 1 and 2).

2.2 The property is shown by the British Geological Survey to be situated on bedrock belonging to the Mylor Slate Formation comprising of hornfelsed slates and siltstones. This is a metamorphic rock formed approximately 359 to 383 million years ago in the Devonian Period. Originally sedimentary rocks formed in open seas by pelagite (marine) deposits.

2.3 These rocks were later locally altered (metamorphosed) by the injection of silica-rich magmas of the Carn Brea Granite intrusion, ranging from large, coarse-crystalline, batholiths to smaller, fine to medium crystalline, often rhyolitic, dykes and sills (elvans).

2.4 The emplacement of the granite has also caused widespread mineralization, principally in the form of sinuous, east northeast to west southwest striking and steeply inclined planar mineralised structures (lodes), which have been extensively exploited in the vicinity, principally for tin and copper ores.

## **3.0 Investigation**

3.1 The property is recorded to lie within the Sett (mine lease area) of an 18<sup>th</sup> and 19<sup>th</sup> century mine named as Pedn-An-Drea. The available maps and plans of the area show numerous, shafts and workings in the general vicinity of the subject property. The principal workings of Pedn-An-Drea Mine were concentrated to the south and would not affect the property.

3.2 The closest recorded mining feature is a drainage tunnel (adit), which connects Bain's/North/Carbis's Shaft to the west of the property and Jack's Shaft to the east of the property. The route of the adit is not shown on any available plans however it is believed that it would pass close to the northern boundary of the property, approximately 50m beneath the surface. This adit has been driven along the alignment of a planar mineralised structure (lode), which is shown to be inclined down to the north and is named as North Lode. North Lode is recorded to have been extensively exploited for tin ores between the adit level and surface. Based on the available information it was not possible to confirm whether the lode would crop out beneath the southern part of the property or if shallow workings on its indicated alignment would present any risks to this part of the property.

3.3 Early mining maps of the area show a lode named as Copper lode, just to the south and on the same alignment of North lode,. There are no available plans showing the extent of any workings on this structure.

3.4 The Investigation, which involved the drilling of four (vertical and inclined at 45°) rotary percussive boreholes, in a pattern designed to provide the optimum for the anticipated lode structure was carried out on 16<sup>th</sup> July 2021. The investigation was designed to confirm the absence of any shallow mining features likely to present a risk to the future stability of the building.

3.5 A total of four vertical and inclined boreholes, totalling 72.6m, were drilled from the tarmacked internal patio area. These were designed to provide maximum coverage for the anticipated mining features whilst avoiding disruption to services. The boreholes were drilled percussively, with a down-the-hole-hammer, using a Holman Uni-track drill rig. After drilling the boreholes were backfilled with the available arisings and the collars plugged with mass concrete.

3.6 The site plan is shown as Figure 2 and on this are shown the borehole locations and any encountered features.

## **4.0 Results**

4.1 The investigation confirmed the presence of intact weathered/fractured buff/brown metamorphic bedrock at a vertical depth of approximately 0.1m beneath the surface which became fresher/less fractured with increasing depths, overlain by tarmac.

4.2 No voids, or any other sub-surface anomalous features were encountered in any of the boreholes. No indications to suggest the proximity of any worked, mineralised structures (lodes) were encountered in any of the boreholes.

## **5.0 Conclusions and Recommendations**

5.1 The investigation confirmed the presence of undisturbed in-situ weathered and fresher metamorphic bedrock within the investigated area and we believe that the subject property (area covered by the boreholes) is not at any risk of subsidence or settlement related to extractive historic metalliferous mining activity (shafts or workings).

5.2 No indications to suggest the presence of the lode indicated to pass through the property was encountered or observed.

## **6.0 Limitations**

This report is in respect of mining related activity it does not constitute a geotechnical assessment. The investigated area is delineated as the area covered by the boreholes. Information obtained from the boreholes is used to infer the likely ground conditions between them and Westcountry Mines & Property Surveys cannot be held responsible for any anomalous features which could not, reasonably have been anticipated, or inferred, from the available data. This report is confidential to the clients, the Mortgage provider and other professional advisors acting for or on behalf of the clients, and is specific to the subject property only. This report cannot be used for any purpose other than to that intended.

**Yours faithfully,**

A handwritten signature in black ink that reads "West Country Mines & Property Surveys". The signature is written in a cursive, flowing style.

**WESTCOUNTRY MINES & PROPERTY SURVEYS**

**Description of horizons:**

**Tarmac:** forming parking areas.

**Metamorphic bedrock:** Moderately hard, buff/brown hornfels.

**Notation:**

Hammer (h); Full (F); Occasional (O); None (N)

Air Returns (a) Full (F); Occasional (O); None (N)

Drill Returns (d) Full (F); Occasional (O); None (N)

**Borehole 1 90°**

Depth (meters down hole)	Horizon	Notation
0.0m – 0.2m	Concrete	Fh/Fa/Fd
0.2m – 3.0m	Hornfels	Fh/Fa/Fd

**Borehole 2 45°****131°**

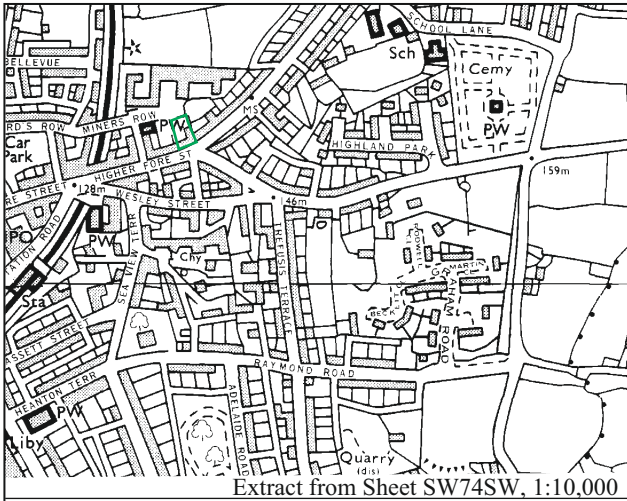
Depth (meters down hole)	Horizon	Notation
0.0m – 0.2m	Concrete	Fh/Fa/Fd
0.2m – 23.2m	Hornfels	Fh/Fa/Fd

**Borehole 3 45°****158°**

Depth (meters Down hole)	Horizon	Notation
0.0m – 0.2m	Minewaste	Fh/Fa/Fd
0.2m – 23.2m	Hornfels	Fh/Fa/Fd

**Borehole 4 45°****187°**




Depth (meters Down hole)	Horizon	Notation
0.0m – 0.2m	Minewaste	Fh/Fa/Fd
0.2m – 23.2m	Hornfels	Fh/Fa/Fd



KEY	
	Site Boundary (as provided)
	Lode
	Workings below adit level
	Shaft/Well
	Minewaste
	Crosscourse

Note: The information displayed on this plan is derived solely from recorded documentary evidence only. This plan applies to the shown/named property only, it must not be used for neighbouring properties as any mining features described are only those relating to the subject property, any adjacent mining features may have been omitted for clarity. This information is confidential to the clients and must not be further distributed without our permission.



KEY	
	Property boundary
	Approximate location and extent of boreholes
	Buildings



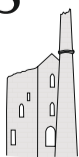
# WESTCOUNTRY MINES

**& PROPERTYSURVEYS**

MINING SUBSIDENCE CONSULTANTS

Grove Farm, East Hill, Blackwater, Truro, Cornwall TR4 8EG

Tel & Fax: 01872 562837 E-mail: [info@westcountrymines.co.uk](mailto:info@westcountrymines.co.uk)



## MINING SITE INVESTIGATION

Ref: 68921

Drawn by: NAP

Checked by: RB

Date: July 2021

Address:

Collins Arms  
18 Higher Fore Street  
Redruth, Cornwall. TR15 2AP

Note: This plan, which is for illustrative purpose only, has been drawn from on-site measurements and does not purport to be an accurate survey.

Figure 2: Site Plan

Scale: 1:150 @ A3

